

AD-A096 461

WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS F/6 8/3
A COMPILATION OF MOORED CURRENT METER DATA AND ASSOCIATED OCEAN--ETC(U)
SEP 80 S A TARBELL N00014-76-C-0197
UNCLASSIFIED WHOI-80-40 NL

CE
40 2
096 461



END

4-81

100

UNCLASSIFIED 9/80

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER (14) WHOI-80-40	2. GOVT ACCESSION NO. AD-A096	3. RECIPIENT'S CATALOG NUMBER 461
4. TITLE (and Subtitle) (6) A COMPILATION OF MOORED CURRENT METER DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME III (POLYMODE ARRAY III CLUSTERS A, B AND SITE MOORINGS) 1977-1979. A 93241 -		5. TYPE OF REPORT & PERIOD COVERED (9) Technical rept.
7. AUTHOR(s) (10) Susan A./Tarbell		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Woods Hole Oceanographic Institution Woods Hole, MA 02543		8. CONTRACT OR GRANT NUMBER(s) (15) N00014-76-C-0197 NSF-OCE 76-24232
11. CONTROLLING OFFICE NAME AND ADDRESS NORDA National Space Technology Laboratory Bay St. Louis, MS 39529 (12)		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR 083-400
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE (11) September 1980
		13. NUMBER OF PAGES 59
		15. SECURITY CLASS. (of this report) Unclassified
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) 1. Current meter 2. Ocean current 3. Moorings		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Summaries are presented of current, pressure and temperature measurements from clusters A and B of the POLYMODE III experiment. These clusters had five moorings apiece and were deployed for 11.5 months. With a few exceptions, current meters were set at nominal depths of 200, 1500 and 4000 m and temperature/pressure recorders at 400 and 2800 m on each mooring. A site mooring was deployed at both cluster locations for an additional 17 months. Displays include time series, histograms, progressive vector diagrams, scatter plots, spectra, and statistics.		

DD FORM 1473 1 JAN 73 EDITION OF 1 NOV 65 IS OBSOLETE S/N 0102-014-6601

UNCLASSIFIED 9/80

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered) 384001

WHOI-80-40

A COMPILATION OF MOORED CURRENT METER DATA
AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS,
VOLUME XXII (POLYMODE ARRAY III CLUSTERS A, B AND SITE MOORINGS)
1977-1979

by

Susan A. Tarbell

WOODS HOLE OCEANOGRAPHIC INSTITUTION
Woods Hole, Massachusetts 02543

September 1980

TECHNICAL REPORT

*Prepared for the Office of Naval Research under
Contract N00014-76-C-0197, NR 083-400 and for
the National Science Foundation under Grant
OCE 76-24232.*

*Reproduction in whole or in part is permitted
for any purpose of the United States Government.
This report should be cited as: Woods Hole
Oceanographic Institution Technical Report
WHOI-80-40.*

*Approved for public release; distribution
unlimited.*

Accession For	
NTIS	<input checked="" type="checkbox"/>
DTIC	<input type="checkbox"/>
UNCLASS	<input type="checkbox"/>
JOINT	<input type="checkbox"/>
REF	<input type="checkbox"/>
INT	<input type="checkbox"/>
EXT	<input type="checkbox"/>
OTHER	<input type="checkbox"/>

A

Approved for Distribution:

Valentine Worthington
Valentine Worthington, Chairman
Department of Physical Oceanography

ABSTRACT

Summaries are presented of current, pressure and temperature measurements from clusters A and B of the POLYMODE III experiment. These clusters had five moorings apiece and were deployed for 11.5 months. With a few exceptions, current meters were set at nominal depths of 200, 1500 and 4000 m and temperature/pressure recorders at 400 and 2800 m on each mooring. A site mooring was deployed at both cluster locations for an additional 17 months.

Displays include time series, histograms, progressive vector diagrams, scatter plots, spectra, and statistics.

Table of Contents for Printed Pages

	Page Number
ABSTRACT	2
Organization of Fiche and Printed Pages	4
ACKNOWLEDGMENTS	6
PREFACE	7
Introduction	8
Instrumentation	14
Data Processing	15
Data Quality	16
Data Presentation	18
References	21
Horizontal Composite Plots	22
Vertical Composite Plots	38

Diagrams of Fiche Organization

1 - A - 4

Fiche #2,3			Basic data presentation				Cluster A & B			
Statistics			&	Spectral diagrams						
				Histograms						
Scatter plots			&	Progressive vector diagrams						
				Variables versus time						
Current meter data identifier			L O C A T I O N							
T/P data identifier										
Statistics			&	Spectral diagrams						
				Histograms						
				Variables versus time						

Fiche #4		Polymode Array 3 Site data for Clusters A & B											
Basic data presentation cont.						Composites							
						</							

ACKNOWLEDGMENTS

The Engineering, Operations and Data Processing sections of the W.H.O.I. Buoy Group designed, prepared, deployed and recovered the moorings, prepared the current meters, processed the data, and produced the data report. TP preparation was carried out under John Dahlen at the Draper Laboratory. TP data were processed by Charmaine King under the direction of Professor Carl Wunsch at M.I.T. Data analysis was by Lee-Lueng Fu and Professor Wunsch.

TP preparation and data processing were supported by National Science Foundation grants OCE 76-80210 and OCE 78-19833. Mooring deployments and recoveries, mooring and current meter preparation, and current meter data processing were funded by National Science Foundation grant OCE 76-24232 and under Office of Naval Research contract N00014-76-C-0197.

PREFACE

This is the twenty-third volume in a series of Technical Reports displaying data recorded by moored instruments.

Volume XXIII presents data from POLYMODE Cluster A, Cluster B and the two Cluster site moorings. Data collected at the POLYMODE Cluster C location is presented by C. J. Koblinsky *et al.* (1979), Oregon State University Reference 79-12, OSU Data Report #75 entitled "A compilation of observations in the Atlantic North Equatorial Current".

W.H.O.I. Technical Report 79-88 contains an index of the data recovered by the Moored Array Project between 1973 and 1978, a bibliography of papers written by associated scientists, and diagrams of mooring locations and durations.

Volume #	W.H.O.I. ref. #		Notes year expt.
I	65-44	Webster, F. and N. P. Fofonoff	
II	66-60	Webster, F. and N. P. Fofonoff	
III	67-66	Webster, F. and N. P. Fofonoff	
IV	70-40	Pollard, R. T.	
V	71-50	Tarbell, S. and F. Webster	
VI	74-4	Tarbell, S.	1967 measurements
VII	74-52	Chausse, D. and S. Tarbell	1968 measurements
VIII	75-7	Pollard, R.T. and S. Tarbell	1970 Array Data
IX	75-68	Tarbell, S., M. G. Briscoe and D. Chausse	1973 IWEX Array
X	76-40	Tarbell, S.	1969a measurements
XI	76-41	Tarbell, S.	1969b measurements
XII	76-101	Chausse, D. and S. Tarbell	1973 MODE Array
XIII	77-18	Tarbell, S. and A. W. Whitlatch	1970 Measurements
XIV	77-41	Tarbell, S., R. Payne and R. Walden	1976 mooring 592 Saint Croix
XV	77-56	Tarbell, S. and A. W. Whitlatch	1971 measurements
XVI	78-5	Tarbell, S. and A. Spencer	1971-1975 MODE Site
XVII	78-49	Tarbell, S., A. Spencer and R. E. Payne	1975-1977 POLYMODE Array II
XVIII	79-65	Tarbell, S., M. G. Briscoe and R. A. Weller	1978 JASIN
XIX	79-34	Spencer, A., C. Mills and R. Payne	1974-1975 POLYMODE Array I
XX	79-56	Spencer, A.	1974 Rise Array
XXI	79-85	Mills, C. and P. Rhines.	1978 W.B.U.C.
XXII	79-87	Tarbell, S. and R. Payne.	1973 measurements

INTRODUCTION

The POLYMODE program is an international cooperative scientific investigation of the dynamics and statistics of mesoscale motions in the sea, the energy sources of these motions, and their contribution to the general circulation of the ocean. POLYMODE includes theoretical investigations, numerical experiments, and field experiments. The largest element of the field program is the statistical-geographical experiment designed to determine the distribution of energy levels and space and time scales of the eddy field throughout the western North Atlantic using current meter arrays, SOFAR float arrays, and hydrographic and XBT work.

Three current meter arrays were set. The locations are shown in Figure 1. Array I was deployed to define the statistics of the mesoscale motions to the east and north of the MODE-I site (28°N , 70°W), and to resolve the time and length scales in that region. Data from Array I were described in a previous report (Spencer, et al., 1979).

The goals of Array II were more closely defined. They involved a comparison of the eddy statistics in a region further to the north and east with those from the first array; an examination of the vertical structure of the eddy field, the contributions of the Reynolds stress to momentum and vorticity budgets for the mean flow, horizontal heat advection, and energy transfer terms; and a comparison with numerical models and ideas about the general circulation. The Array II data were also described in an earlier report in this series (Tarbell, et al., 1978).

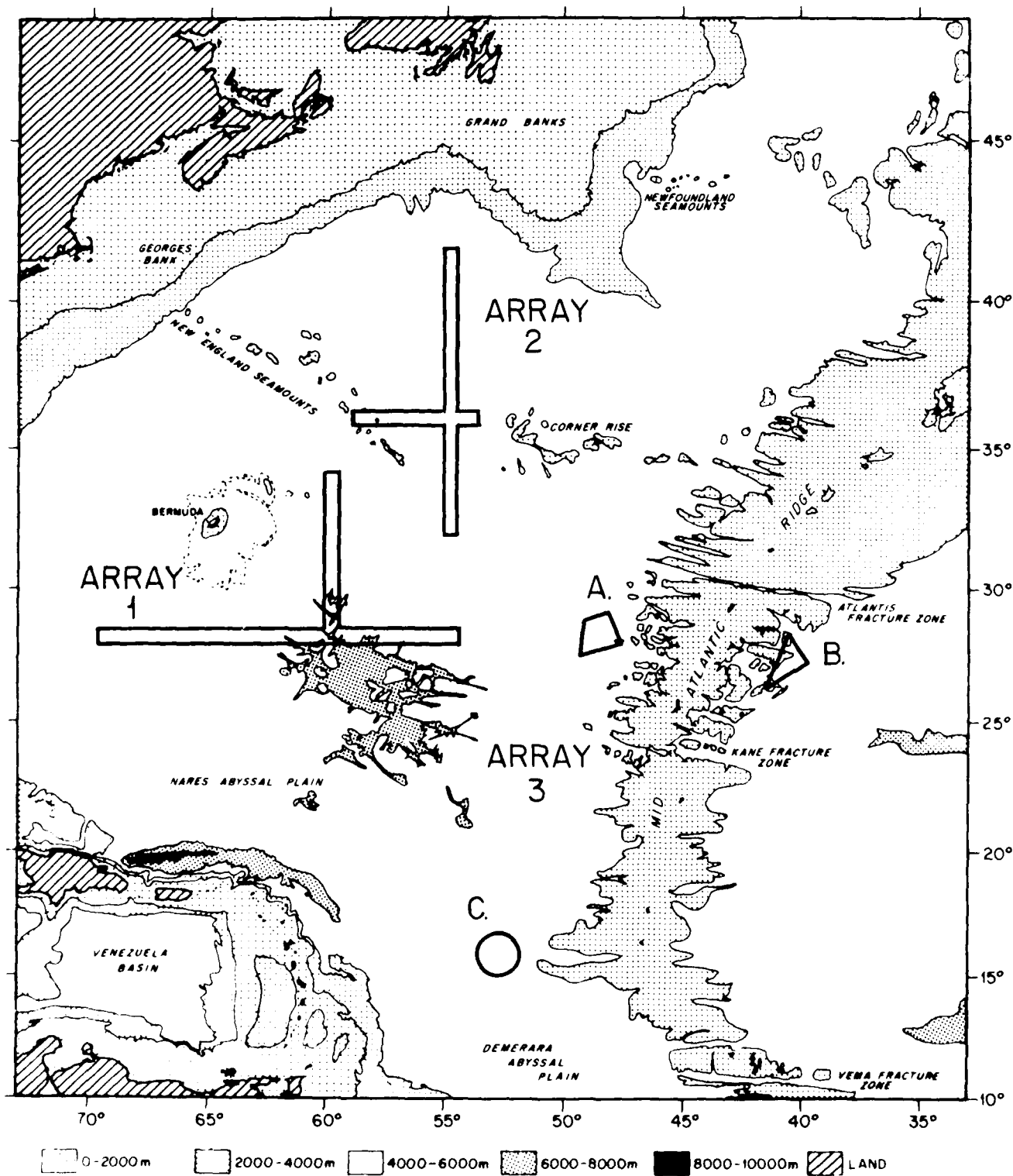


Figure 1. Location of POLYMODE Arrays 1, 2 and 3

Array III was composed of three clusters. Cluster C was designed to look at the baroclinic instability of the North Equatorial Counter-current as an eddy-producing mechanism. The moorings in this cluster were set and retrieved, and the data processed by Nova University personnel.

Clusters A and B, the subject of this report, were located on the western and eastern sides of the Mid-Atlantic Ridge. They were designed to examine differences in the eddy field and the mean flow on either side of this mid-ocean feature, and to compare the eddy statistics in this region with similar statistics in previously studied regions. The complete clusters were set for 11.5 months. One mooring in each cluster was redeployed for an additional 17 months (site moorings) to gain additional information on long period statistics. We might add that the 17 months is the longest mooring duration that the Buoy Group has attempted.

Locations of the moorings in clusters A and B are shown in Figure 1, relative mooring positions in Figure 2. Mooring details are given in Table 1.

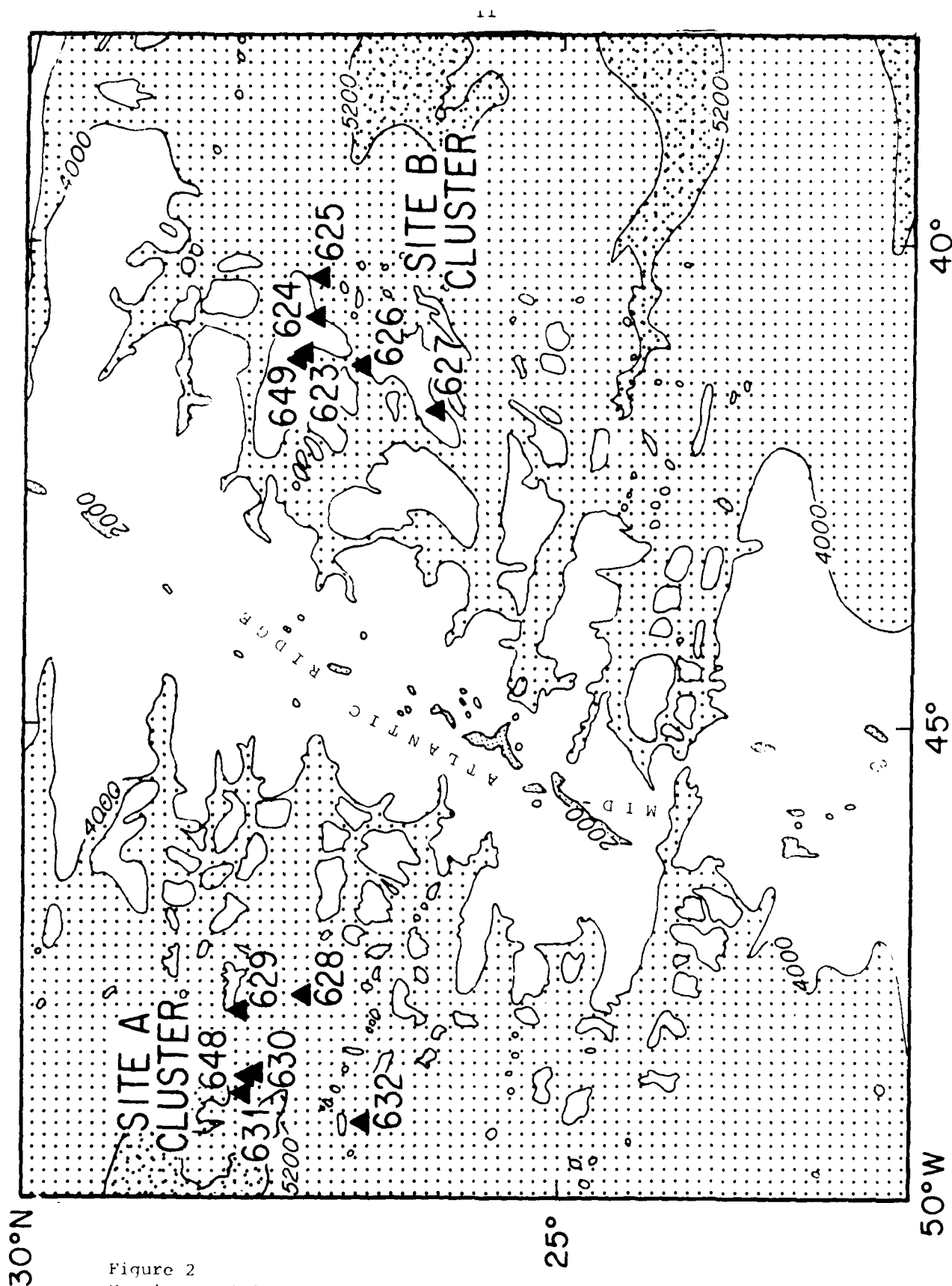


Figure 2
Mooring positions of Cluster A & B (623-632) and the later Site A & B (648-649) moorings.

TABLE 1

Mooring and instrument information, depth measured in meters, data sampling measured in seconds (5.27/3600 is a burst sampled series with bursts of data every 3600 seconds). Variables include East component, North component, Direction, Speed, Temperature, Pressure and Time.

```

*MOORING - - - - -
*NO.*TYPE*DEPTH*LATITUDE* LONG.*DAYS* SET /RECOVERED * COMMENTS
*DATA - - - - -
* NC. *DEPTH*INSTR.* SAMPLING *DAYS* VARIABLES*
-----
623 INT 4251 27 24.8N 41 07.7W 349 77- VI -11/78- V -26 CLUSTER B
6231 128 V-5113 900 346 ENDSTT
6232 496 TP#20 1920 348 TPT
6233 843 TP#44 1920 345 TPT
6234 1426 M-142T 5.27/3600 345 ENDSTT
6235 2801 TP#07 1920 295 TPT
6237 3927 M-256T 5.27/3600 345 ENDSTT
6238 4307 TP#62 1920 345 TPT MOUNTED ON RELEASE

624 INT 4372 27 17.5N 40 45.5W 347 77- VI -12/78- V -25 CLUSTER B
6241 214 TP#27 1920 344 TPT
6242 529 M-198C 5.27/3600 344 ENDSTT
6243 1528 M-207T 5.27/3600 344 ENDSTT
6244 2829 TP#28 1920 344 TPT
6245 4028 M-260T 5.27/3600 175 ENDSTT CHANNEL A ONLY

625 INT 4723 27 14.5N 40 21.1W 347 77- VI -14/78- V -25 CLUSTER B
6251 189 V-0106 900 343 ENDSTT
6252 483 TP#5 1920 343 TPT
6253 1488 M-206C 5.27/3600 343 ENDSTT
6254 2807 TP#29 1920 343 TPT
6255 3990 M-261T 5.27/3600 343 ENDSTT

626 INT 4315 26 52.7N 41 12.8W 346 77- VI -13/78- V -25 CLUSTER B
6261 215 V-0434 900 101 ENDSTT MOTOR DRIVER BOARD
6262 507 TP#37 1920 153 TPT
6263 1514 M-212T 5.27/3600 342 ENDSTT
6264 2821 TP#45 1920 342 TPT
6265 4015 M-227C 5.27/3600 342 ENDSTT

627 INT 3857 26 09.3N 41 40.7W 344 77- VI -14/78- V -24 CLUSTER B
6271 206 V-0111 900 341 ENDSTT
6272 531 TP#54 1920 341 TPT
6273 1505 M-213T 5.27/3600 341 ENDSTT
6274 2800 TP#51 1920 190 TPT
6275 3407 M-269C 5.27/3600 341 ENDSTT WATER IN CASE

```

Table 1 (cont.)

628 INT	4961	27 25.6N	47 50.0W	340	77- VI -16/78- V -22	CLUSTER A
6282	505	M-240T	5.27/3600	31	ENDSTT	ROTOR QUIT APRIL 15
6283	1489	M-271T	5.27/3600	300	ENDSTT	
6284	2807	TP#10	1920	337	TPT	
6285	3994	M-272C	5.27/3600	337	ENDSTT	NO ROTOR AUG.15 TO JAN.15
629 INT	4954	28 01.0N	48 03.3W	339	77- VI -17/78- V -22	CLUSTER A
6291	203	V-0435	900	336	ENDSTT	
6292	505	TP#47	1920	336	TPT	
6293	1500	M-257T	5.27/3600	336	ENDSTT	
6294	2807	TP#11	1920	273	TPT	
6295	4006	M-273T	5.27/3600	336	ENDSTT	CLOCK DRIFTS 13H.
630 INT	4895	27 51.7N	48 39.4W	338	77- VI -17/78- V -21	CLUSTER A
6301	200	V-0184	900	335	ENDSTT	
6302	542	TP#50	1920	335	TPT	
6304	1498	M-215T	5.27/3600	335	ENDSTT	
6305	2800	TP#17	1920	335	TPT	
6306	3498	TP#6	1920	335	TPT	
6308	4908	TP#61	1920	335	TPT	
631 INT	5106	27 55.8N	48 52.1W	337	77- VI -18/78- V -18	CLUSTER A
6311	212	V-5105	900	334	ENDSTT	
6312	546	TP#13	1920	334	TPT	
6313	1510	M-276T	5.27/3600	334	ENDSTT	NO COMPASS VALUES
6314	2857	TP#3	1920	334	TPT	
6315	4016	M-262T	5.27/3600	334	ENDSTT	
632 INT	4881	26 51.8N	49 13.5W	336	77- VI -18/78- V -20	CLUSTER A
6321	190	V-0436	900	334	ENDSTT	
6323	1488	M-264T	5.27/3600	165	ENDSTT	NO ROTOR VALUES AFTER DEC. 2
6324	2796	TP#24	1920	333	TPT	
6325	3993	M-266T	5.27/3600	333	ENDSTT	
648 INT	4981	27 51.4N	48 40.8W	515	78- V -22/79- X -18	CLUSTER A SITE
6481	178	V-0109	900	513	ENDSTT	
6482	478	TP#73	1920	513	TPT	
6483	828	TP#35	1920	513	TPT	
6484	1479	V-0117	900	513	ENDSTT	
6485	2779	TP#39	1920	513	TPT	
6486	3478	TP#46	1920	513	TPT	
6487	3978	V-0118	900	513	ENDSTT	
649 INT	4268	27 25.6N	41 09.4W	513	78- V -26/79- X -20	CLUSTER B SITE
6491	216	V-0108	900	511	ENDSTT	
6492	516	TP#74	1920	512	TPT	
6493	866	TP#30	1920	512	TPT	
6494	1517	M-175C	5.27/3600			Flooded
6495	2818	TP#40	1920	512	TPT	
6496	3417	TP#81	1920	512	TPT	
6497	4018	V-0108	900	511	ENDSTT	

Instrumentation

The instruments represented in this data report are the Vector Averaging Current Meter (VACM), the EG&G Model 850 and the Temperature-Pressure Recorder (TP).

Both current meters use a Savonius rotor to measure water speed and a vane and internal compass to measure direction. In the VACM, east and north components are calculated from the compass and vane values 8 times per rotor revolution. The components are accumulated over the recording interval resulting in vector averaged velocities. In the 850 a series of 5.27 second samples of speed and instantaneous direction samples are recorded at the beginning of each recording interval. The VACM and 850 have a thermistor embedded in their end caps just above the vane. Temperature accuracy is approximately $.01^{\circ}\text{C}$ (Payne *et al.*, 1976). Resolution is $.07 \times 10^{-3}^{\circ}\text{C}$ for the VACM and $3.6 \times 10^{-3}^{\circ}\text{C}$ for the 850 current meter.

The suffix "t" on an 850 instrument designation (M-261t) means that the instrument has been modified to measure temperature. The suffix "e" (M-206e) means that it has had complementary metal oxide semiconductor (CMOS) circuitry installed and also measures temperature.

The TP was developed at the Draper Laboratory of M.I.T and has been used extensively since 1973. Temperatures have a resolution of $.001^{\circ}\text{C}$ and an accuracy of $.01^{\circ}\text{C}$ (Wunsch and Dahlen, 1974). Pressures are accurate to about .03% of full scale for each sensor.

All three types of instruments contain crystal oscillators with an accuracy of ± 1 second per day to set the time base. The VACM and TP record on Phillips-type cassettes with Sea-Data recorders. The 850 records on endless loop magnetic tape cartridges.

Data Processing

Current meter data processing was done at Woods Hole Oceanographic Institution (W.H.O.I.), TP data processing by Prof. Wunsch's data processors at the Massachusetts Institute of Technology (M.I.T.).

The data on the current meter cassettes and cartridges were transcribed to 9-track computer compatible tapes, converted to scientific units, edited to remove launch and retrieval transients, and linearly interpolated across missing or erroneous data cycles.

The data are identified by a mooring number (here 623-632, 648, 649), a sequential instrument position numbered from the top of the mooring down (e.g., 6481 is the top instrument on mooring 648), a letter to indicate the data version (e.g., 6481B has been through two editing steps; \$ indicates the record required no editing), and a number to indicate the data interval in seconds for that version (e.g., 6481B900 is the 15 minute (or 900 second) basic data series). 1H after the letter would indicate a one-hour averaged version, 24 GAU indicates a 24 hour subsampled version of a Gaussian filtered (24 hour half width) series.

Data Quality

Table 2 contains a list of record numbers in which the instruments malfunctioned and an indication of the problem.

In general the VACMs behaved very well. Out of 13 instruments there was only one malfunction, a tape recorder failure.

Out of 23 850 current meters, 10 returned good records. The other 13 experienced a variety of problems, a few of which resulted in complete loss of data.

A total of 34 TPs was deployed; 15 of these returned good data; 8 appear to have a long term drift in pressure over the length of the record although 6 of these remain within sensor specifications. In two pressure records the drift rate changed rather abruptly part way through the record. A variety of problems was involved in the other eleven malfunctions.

TABLE 2
INSTRUMENT PROBLEMS

Data Name	Instrument	Problem
6235	TP	Minor pressure drift
6236	TP	No data
6237	850	Short, bad temperature
6238	TP	Minor pressure drift
6245	850	Short-channel A
6252	TP	Minor drift in pressure
6255	850	Clock lost 3 hours, temperature malfunction
6261	VACM	Short-tape recorder malfunction
6262	TP	Short
6274	TP	Short, temperature only
6275	850	Temperature only, water in case
6281	TP	No data
6282	850	Clock malfunction-record split into 2 pieces
6283	850	Water in case-rotor stopped 15 April
6284	TP	Minor pressure drift
6285	850	No rotor values 15 August-15 January
6294	TP	Minor pressure drift
6295	850	Clock fast, temperature bad from 1 March
6303	TP	No data
6305	TP	Temperature only
6306	TP	Minor pressure drift, rate decreases
6307	850	No data
6308	TP	Minor pressure drift
6313	850	No compass entire record
6314	TP	Minor pressure drift, rate decreases
6315	850	Bad temperature
6322	TP	No data
6323	850	Short record-rotor died 2 December
6325	850	<u>Very</u> low speeds
6483	TP	Minor pressure drift
6485	TP	Short record
6494	850	Flooded, no data
6495	TP	Short record
6496	TP	Almost no data, not included in this report

Data Presentation

The presentations in this report are time series, progressive vector plots, spectra, mean statistics, histograms and scatter plots. Additional details are below. Presentations for individual data files are presented only in the microfiche portion.

Time Series

The presentations use either the basic series or a 24 hour series. To make the 24 hour series, the basic series is first filtered using a symmetrical running Gaussian filter with a half width of 24 hours. The filtering is sequential and the resultant time series is 48 hours shorter than the input time series. A simple running hat filter is then applied to form a series with one data point per 24 hours, the interval centered on noon.

Variables versus time and current vectors ("stick plots") versus time are presented. The former are based on the basic series, the latter on the 24 hour series.

There are several composite plots containing all the data of a single variable, temperature, for example, from a single mooring or a particular level. The units for each plot are specified in the title. On these composite plots the numbers which appear in several places on the y scale are the reference points for each successive plot. Each occurrence sets a reference for one of the curves with successive appearances of the number referring to the curves in the same vertical order.

Progressive Vector Diagrams

Based on the basic series, the current vectors are placed tail-to-head so as to show the path that a perfect particle in a perfectly homogeneous fluid would have traveled. The plots are useful for giving an idea of flow regimes and low frequency behavior. Symbols denote the beginning of a month.

Spectra

The horizontal kinetic energy (HKE) and (where available) the temperature series are displayed as spectra computed from the basic series.

The horizontal kinetic energy spectrum is half the sum of the spectra of the east and north components: it has the advantage of not being tied to a particular coordinate system.

The HKE and temperature spectra have units of $(\text{cm}^2/\text{sec}^2)/\text{cph}$ or $(^\circ\text{C})^2/\text{cph}$, respectively. The spectra are all one-sided, i.e., the area under the spectrum is equal to the variance of the original record. The spectra are presented as log-log plots ("not variance preserving").

The VACM spectra are all calculated based on averaging across four data segments of 4000 points each, followed by frequency-band averaging across three frequencies with a recording interval of 900 s. This gives a lowest frequency of $(666.7\text{h})^{-1}$ and a highest frequency of $(0.5\text{h})^{-1}$. The 850 spectra are based on averaging across a single data segment of up to 4000 points, followed by frequency band averaging across eight frequencies. With a recording interval of 1800 s this gives a lowest frequency of as low as $(500\text{h})^{-1}$ and a maximum frequency of $(1\text{h})^{-1}$. No data windowing or prewhitening has been done on the initial cluster setting but data from the site mooring (648, 649) were prewhitened.

TIMSAN, the W.H.O.I. program (Hunt, 1977) used to produce the spectra, additionally averages the spectra in increasing groups at the higher frequencies to prevent having to plot thousands of points; this gives few degrees of freedom (d.o.f.) at the lowest frequencies, many at the highest frequencies. For spectra calculated from 4 pieces with 3 frequencies averaged, there are 24 d.o.f. in the 30 lowest frequencies and 1200 d.o.f. in the two highest frequencies; the 95% confidence limits corresponding to these two extremes are (.61, 1.94) and (.97, 1.03).

Mean Statistics

The statistics for each variable for the time period shown are given for the basic series, also the east and north covariance, correlation, and vector statistics.

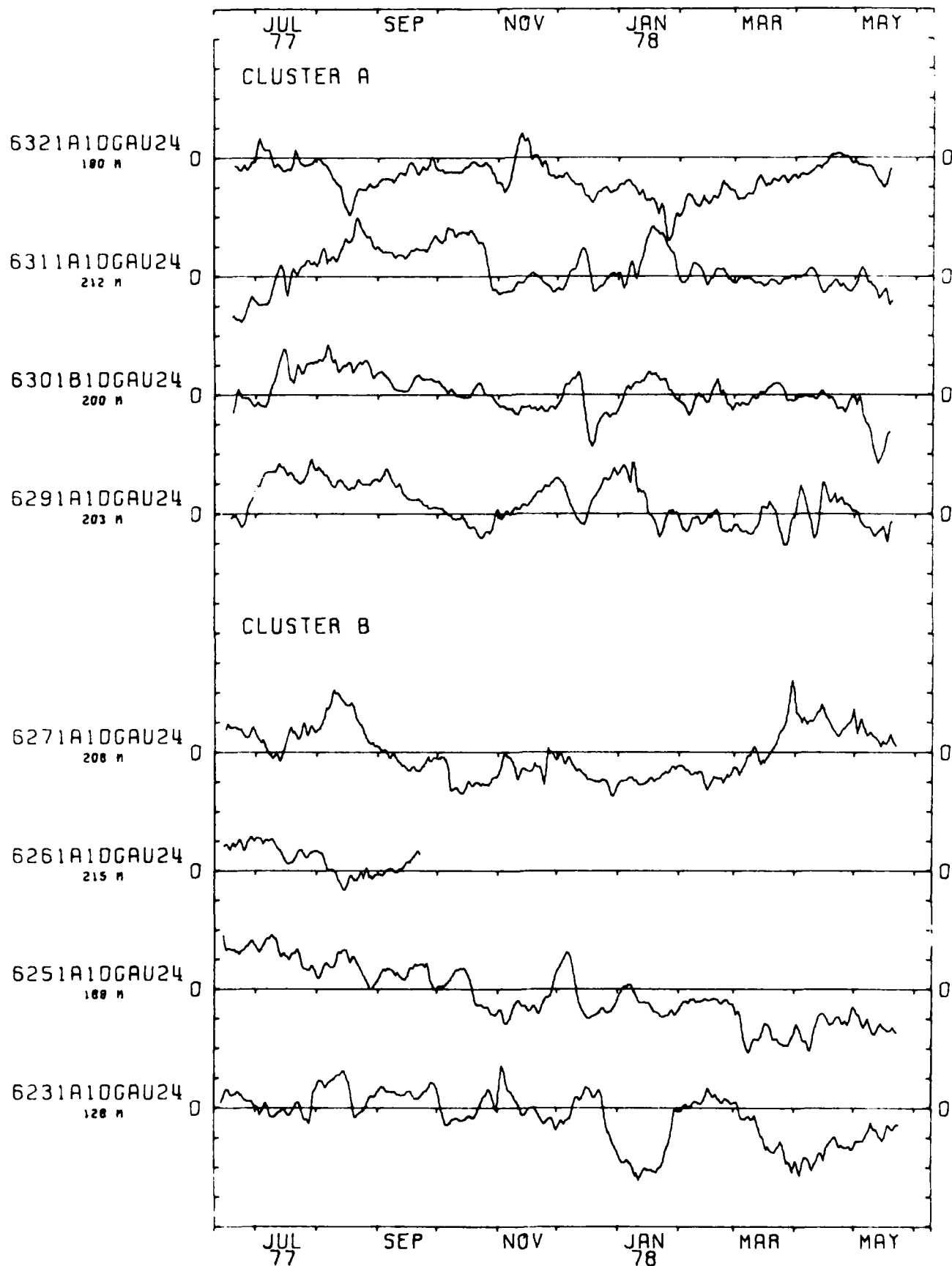
For reference note that a Gaussian random variable would have a kurtosis of 3 and a skewness of zero.

References

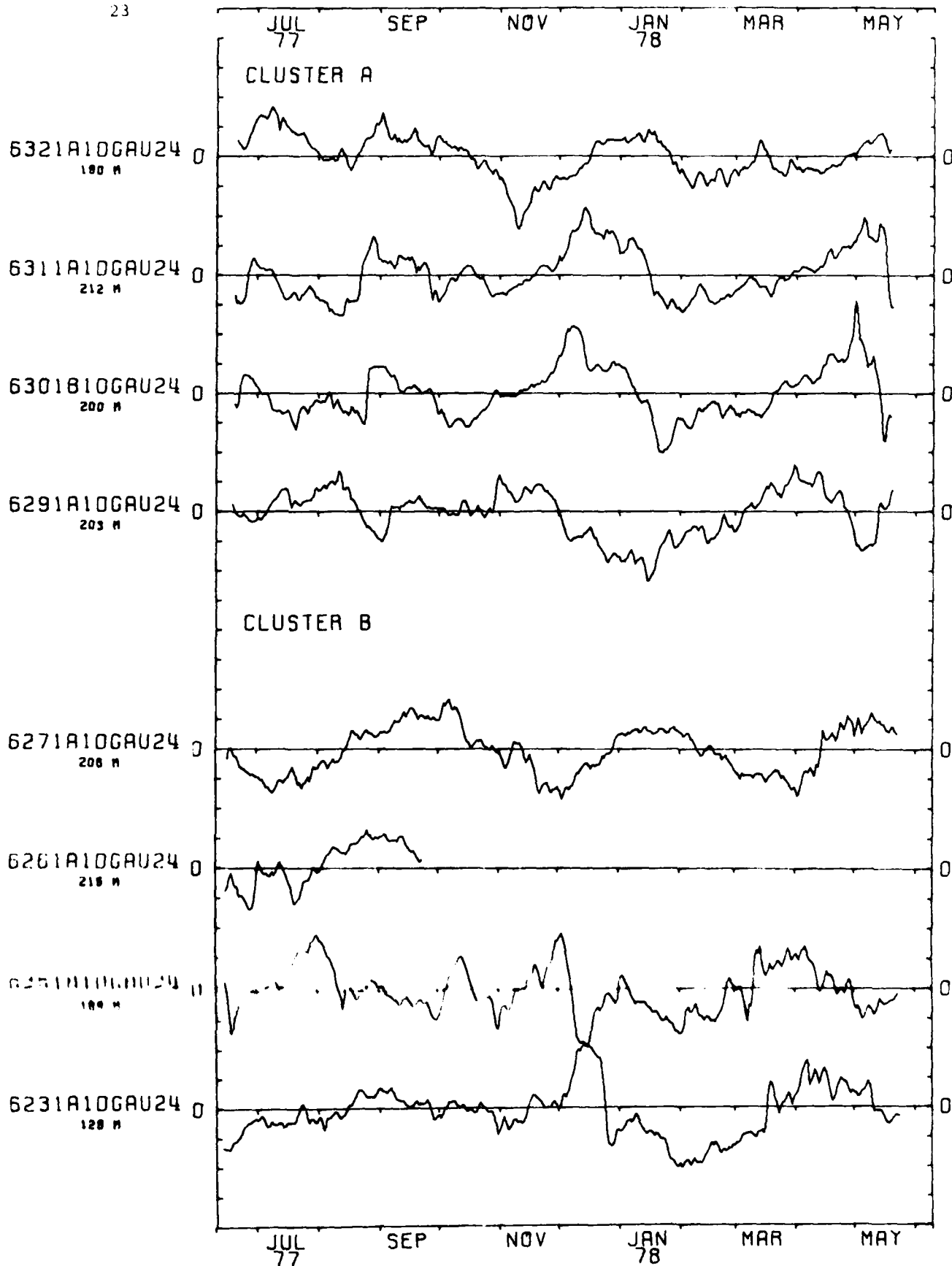
- Hunt, M., 1977, A program for spectral analysis of time series. Woods Hole Oceanographic Institution Technical Memorandum W.H.O.I. 2-77.
- Payne, R. E., A. L. Bradshaw, J. P. Dean and K. E. Schleicher, 1976, Accuracy of temperature measurements with the VACM. Woods Hole Oceanographic Institution Technical Report W.H.O.I. 76-94.
- Wunsch, C. and J. Dahlen, 1974, A moored temperature and pressure recorder. Deep-Sea Research, 21, 145-154.

PRECEDING PAGE BLANK-NOT FILMED

EAST COMPONENTS AT 200M. DEPTH, UNITS OF 10 CM/SEC

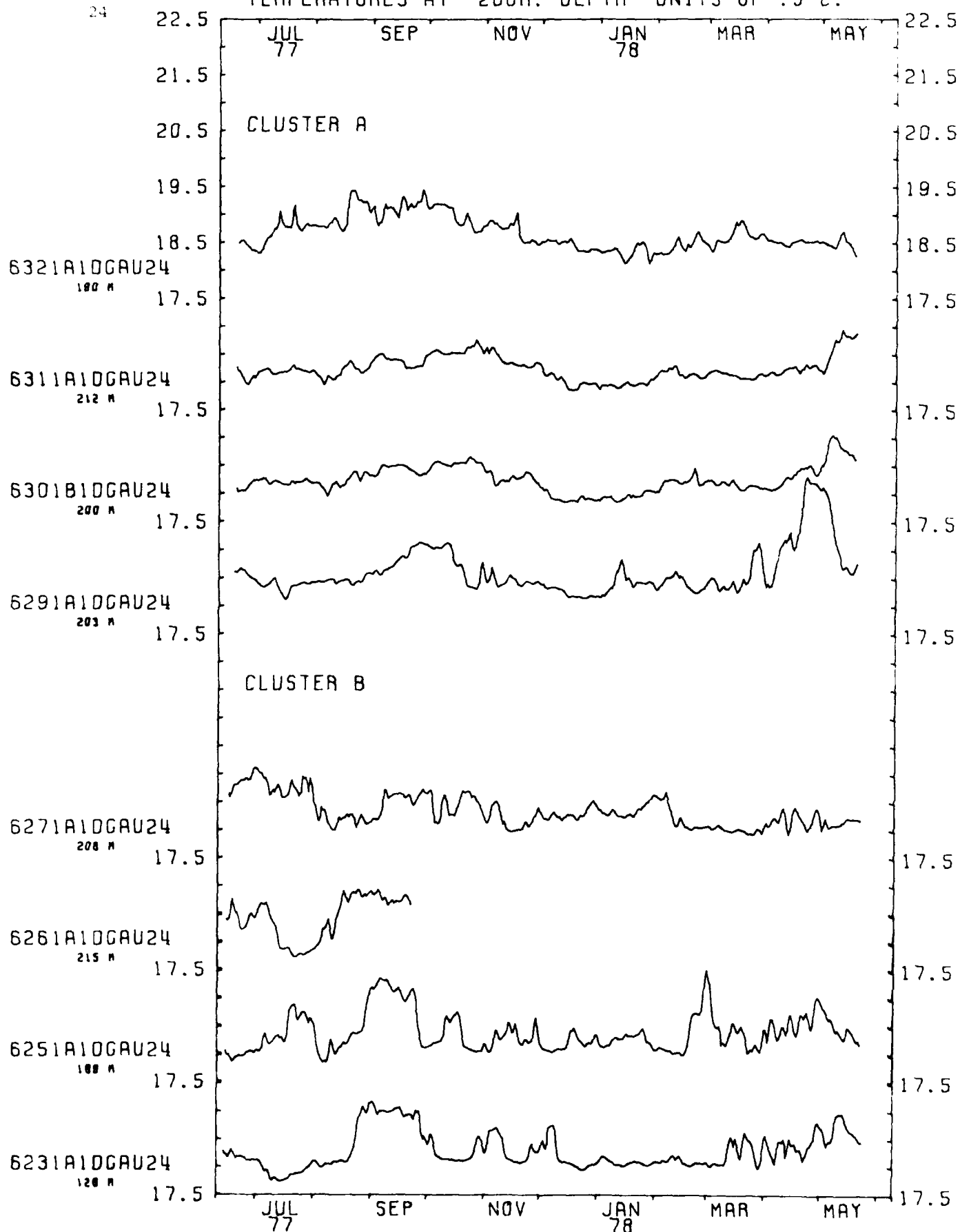


NORTH COMPONENTS AT 200M. DEPTH. UNITS OF 10 CM/SEC



24

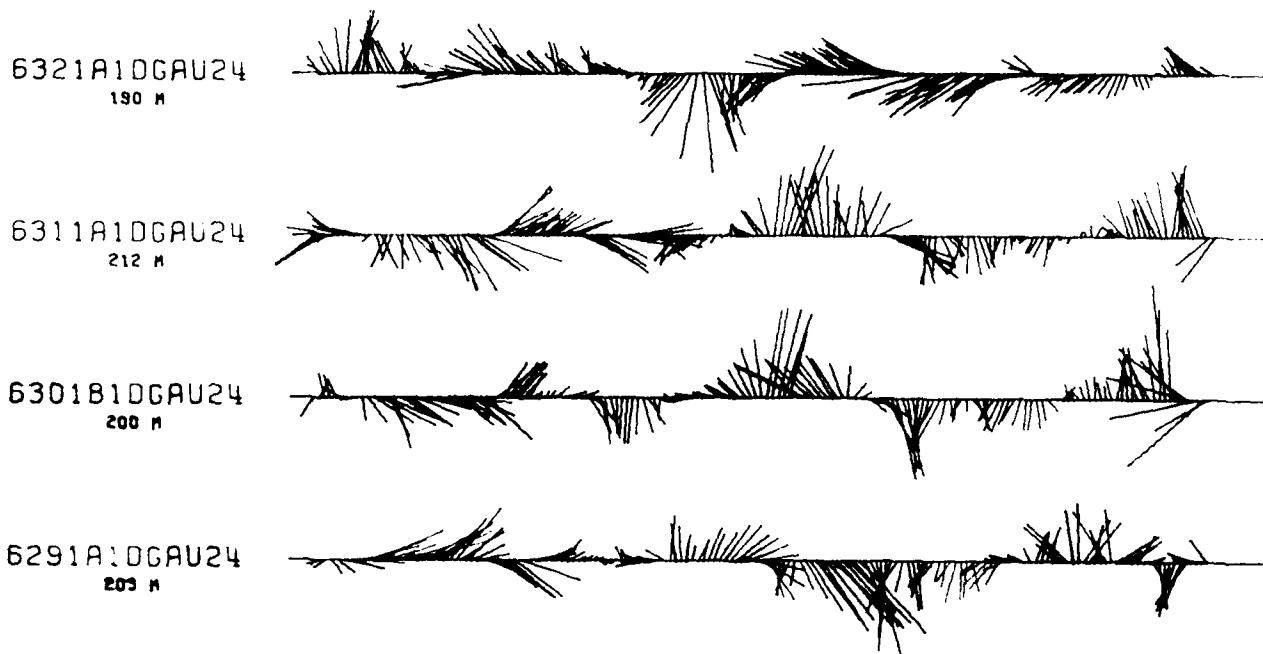
TEMPERATURES AT 200M. DEPTH UNITS OF .5 C.



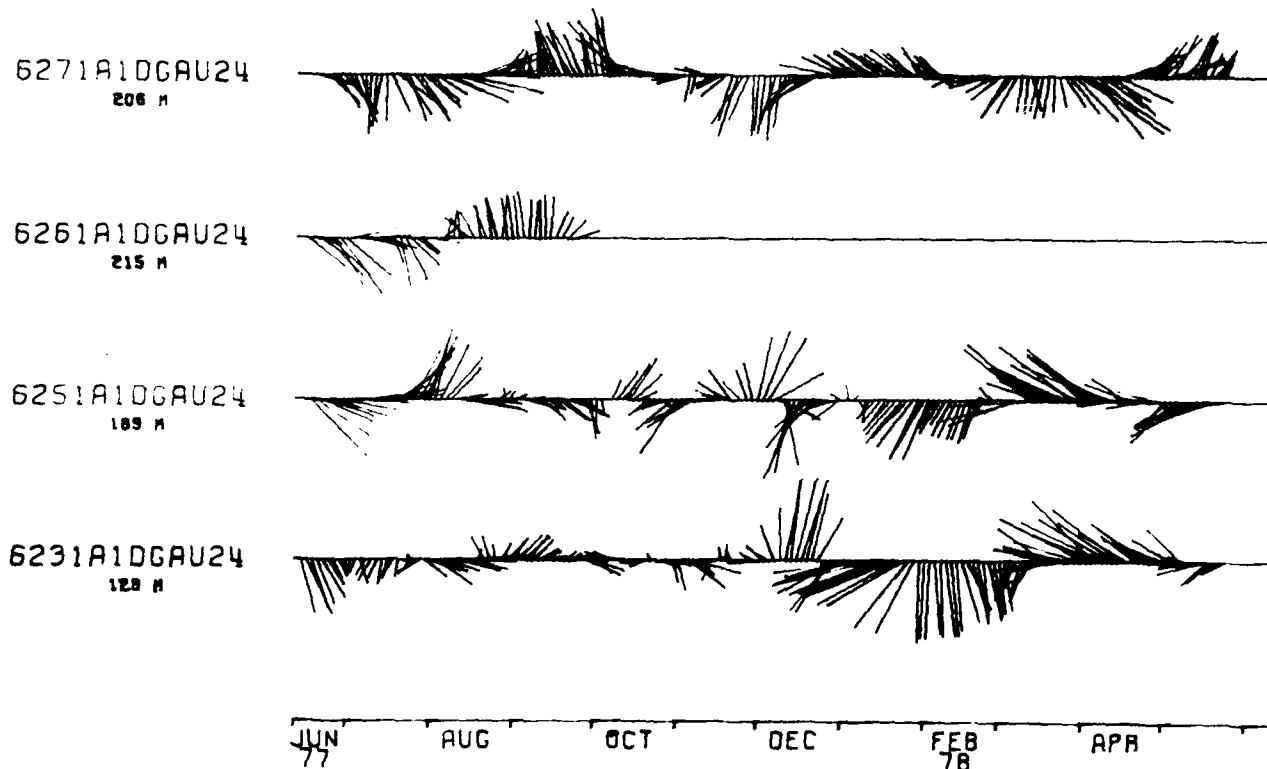
25
NORTH IS UP 200M. DEPTH. UNITS OF 10 CM/SEC

JUN 77 AUG OCT DEC FEB 78 APR

CLUSTER A

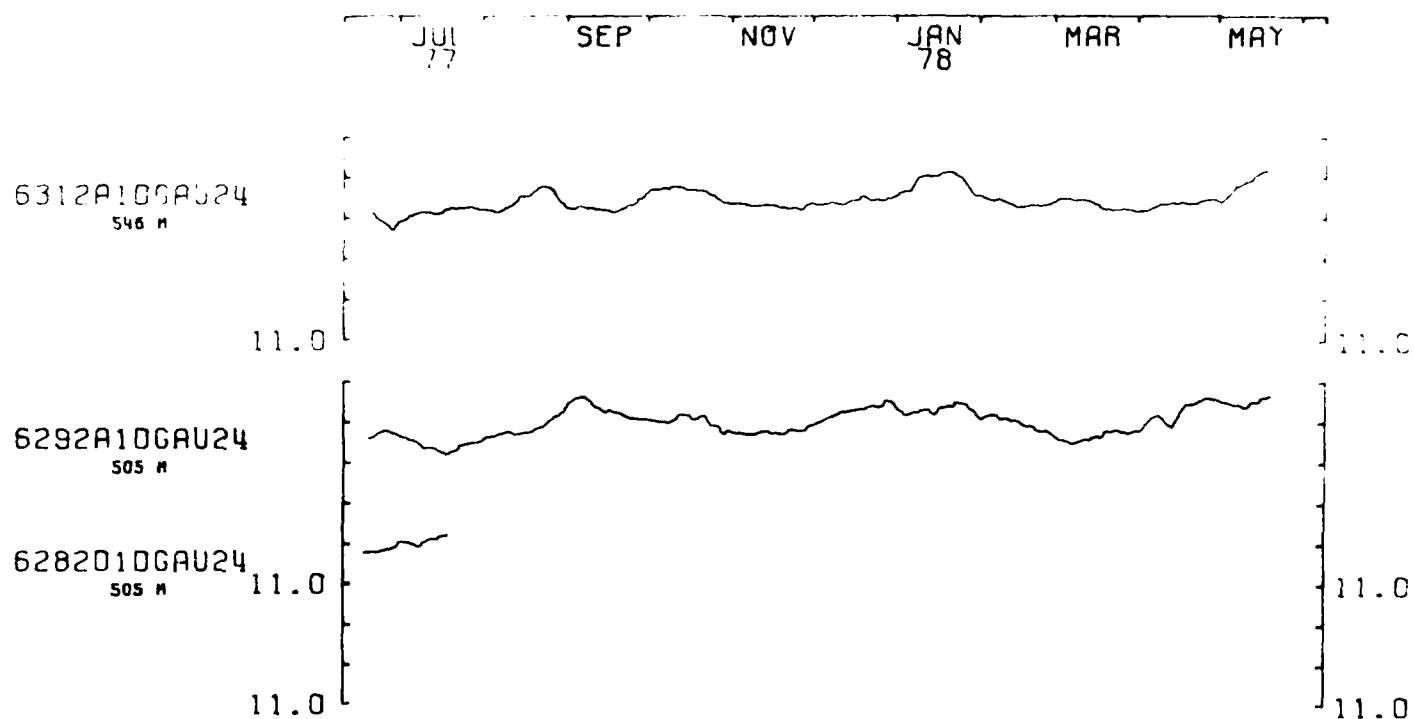


CLUSTER B

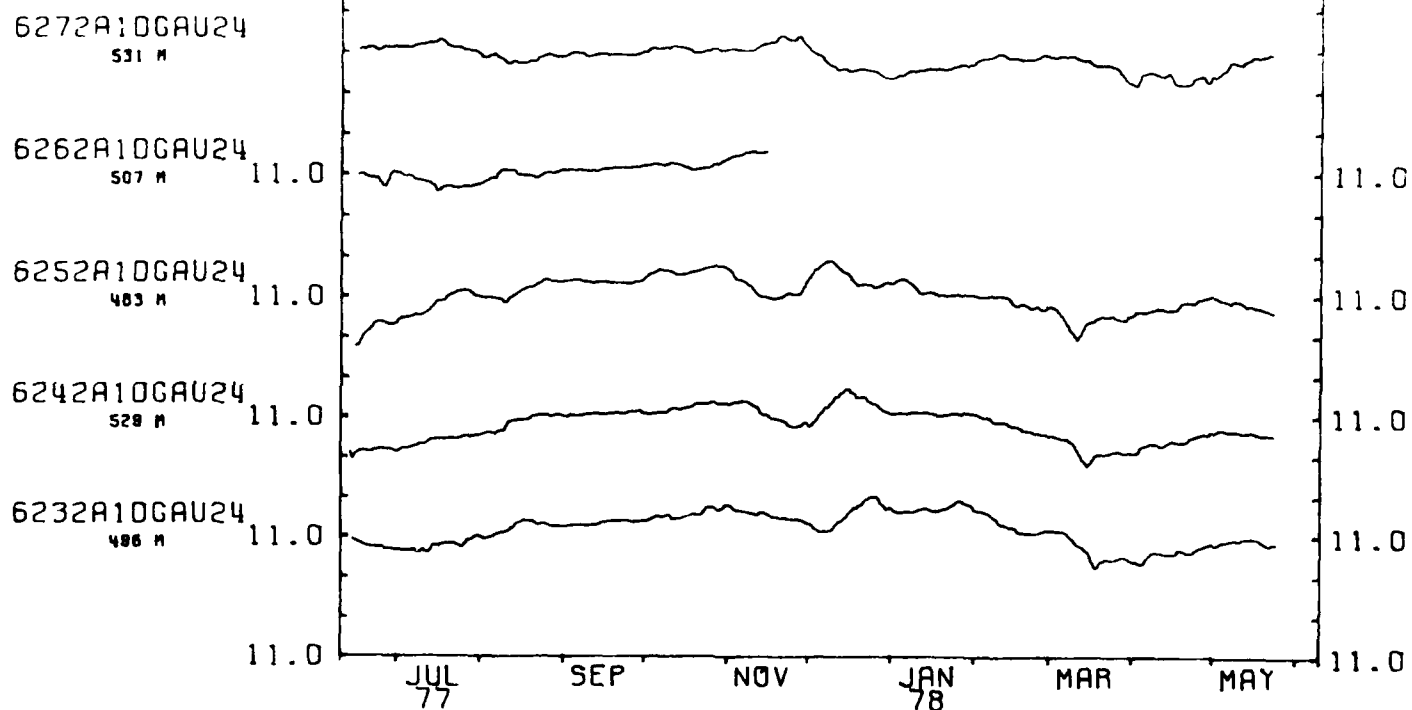


TEMPERATURES AT 500M. DEPTH
CLUSTER A

UNITS OF 1.0 C.

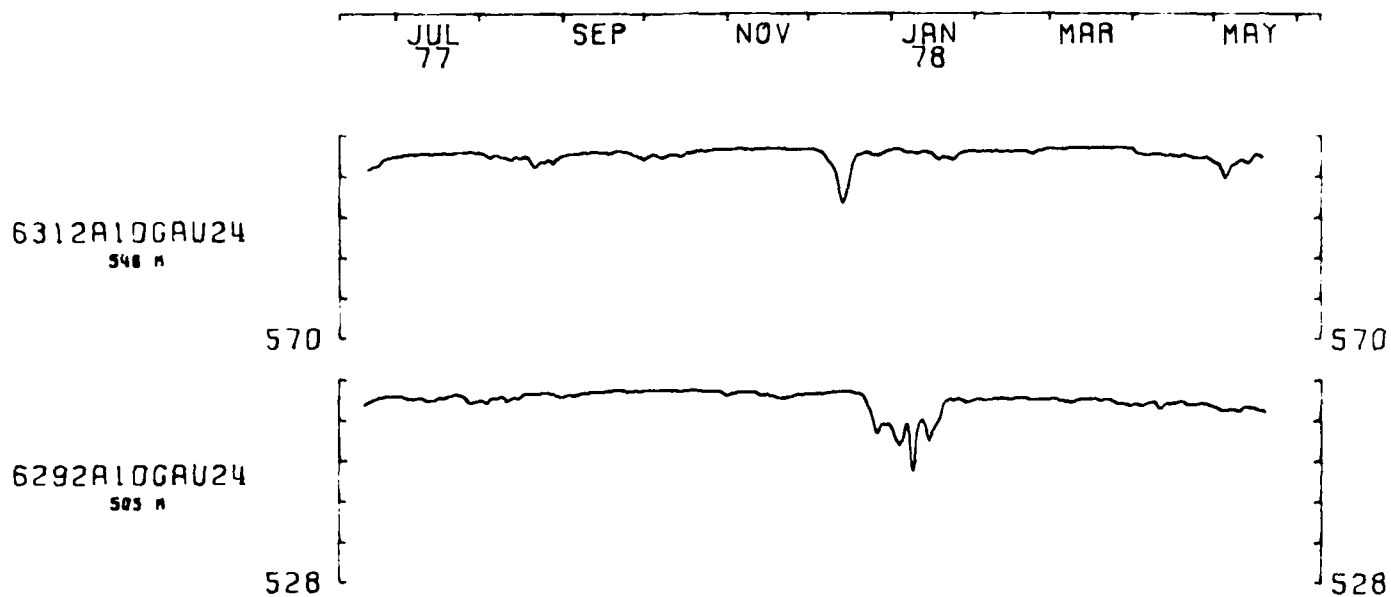


CLUSTER B

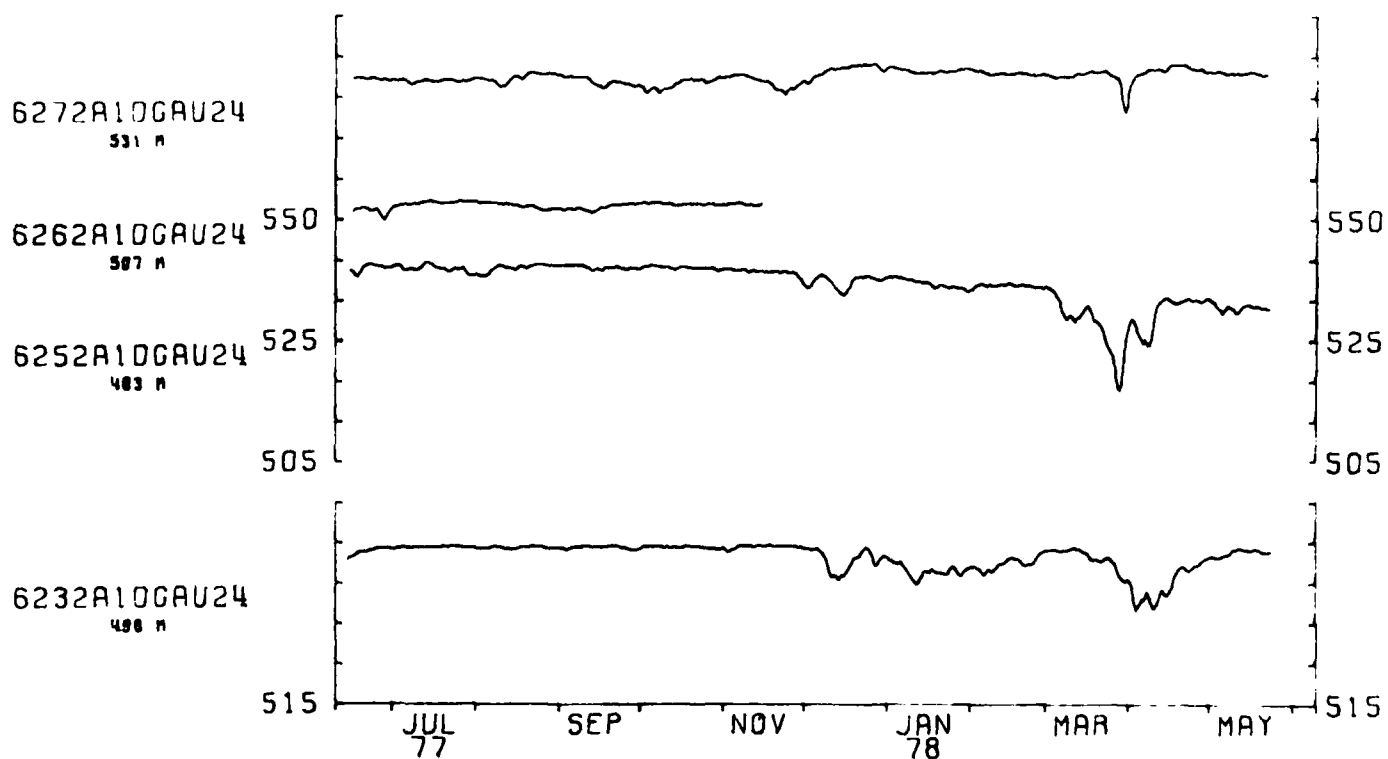


PRESSURES AT 500M. DEPTH UNITS OF 4 OBS.

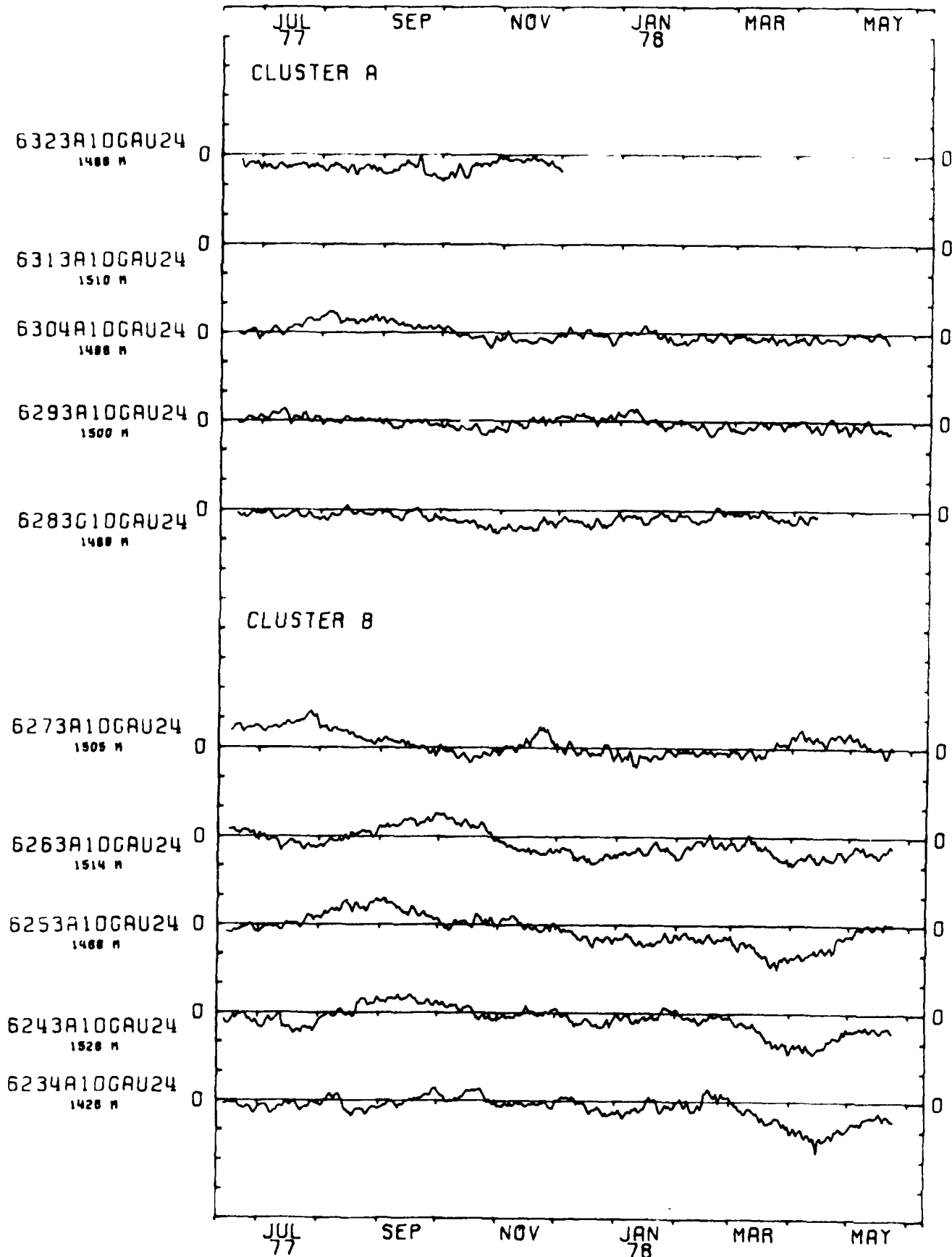
CLUSTER A



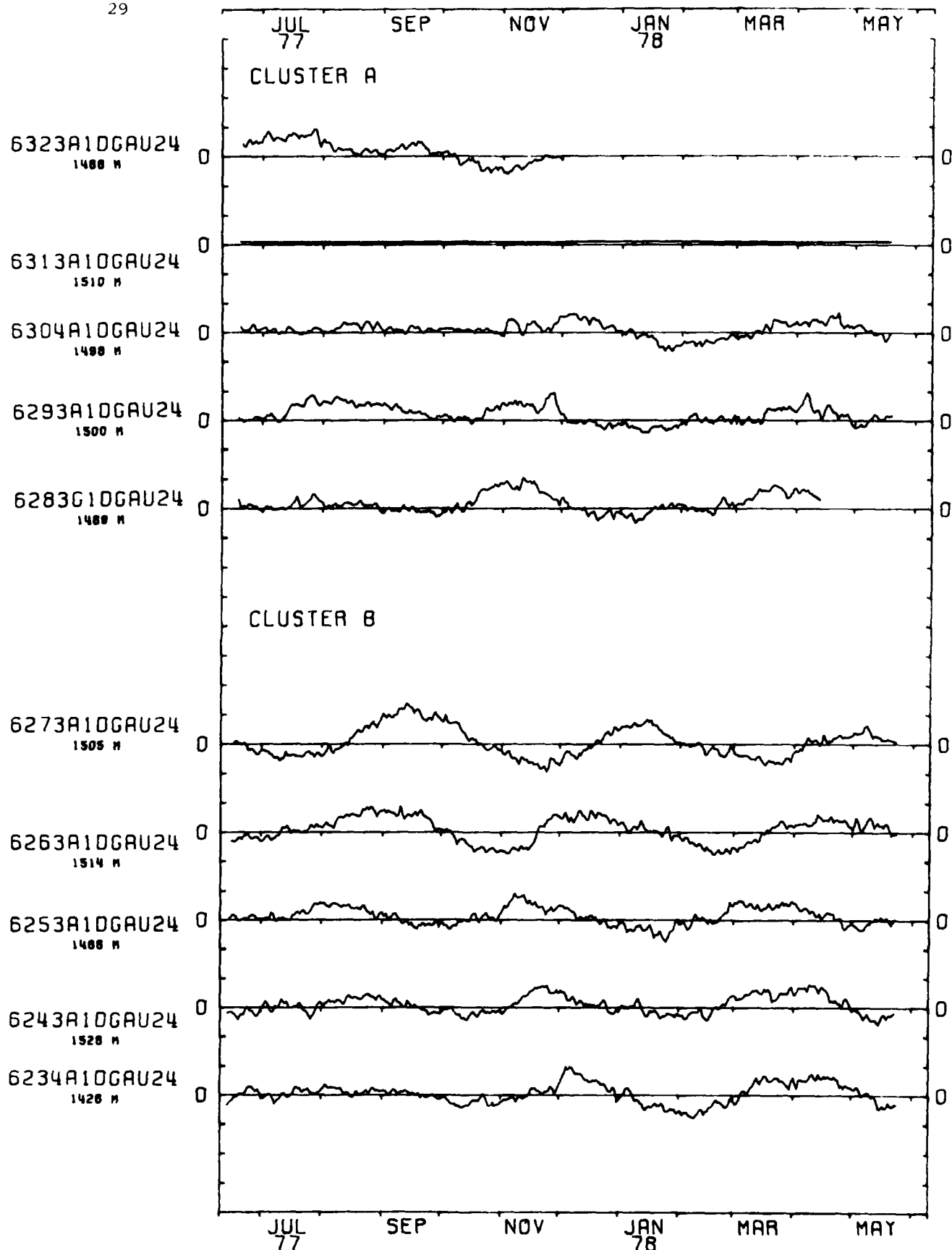
CLUSTER B



EAST COMPONENTS AT 1500M. DEPTH, UNITS OF 2.5 CM/SEC

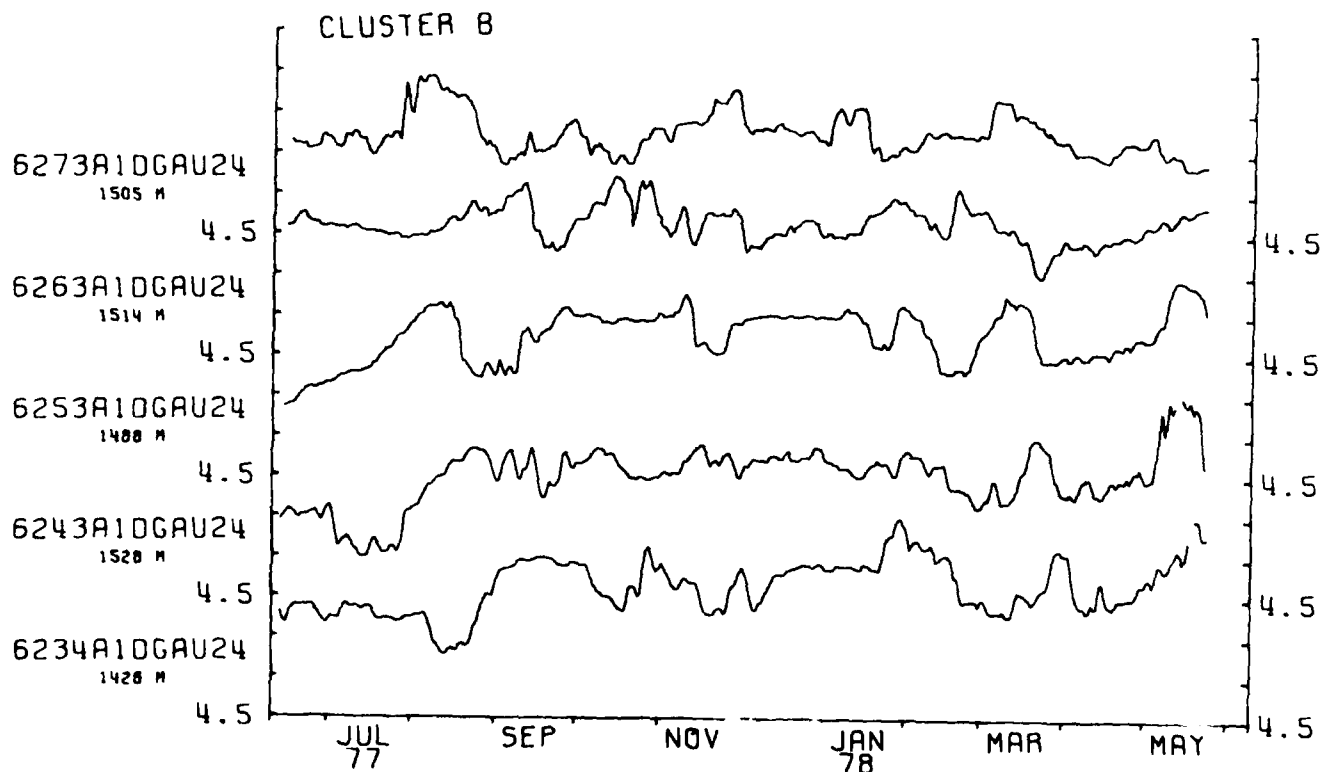
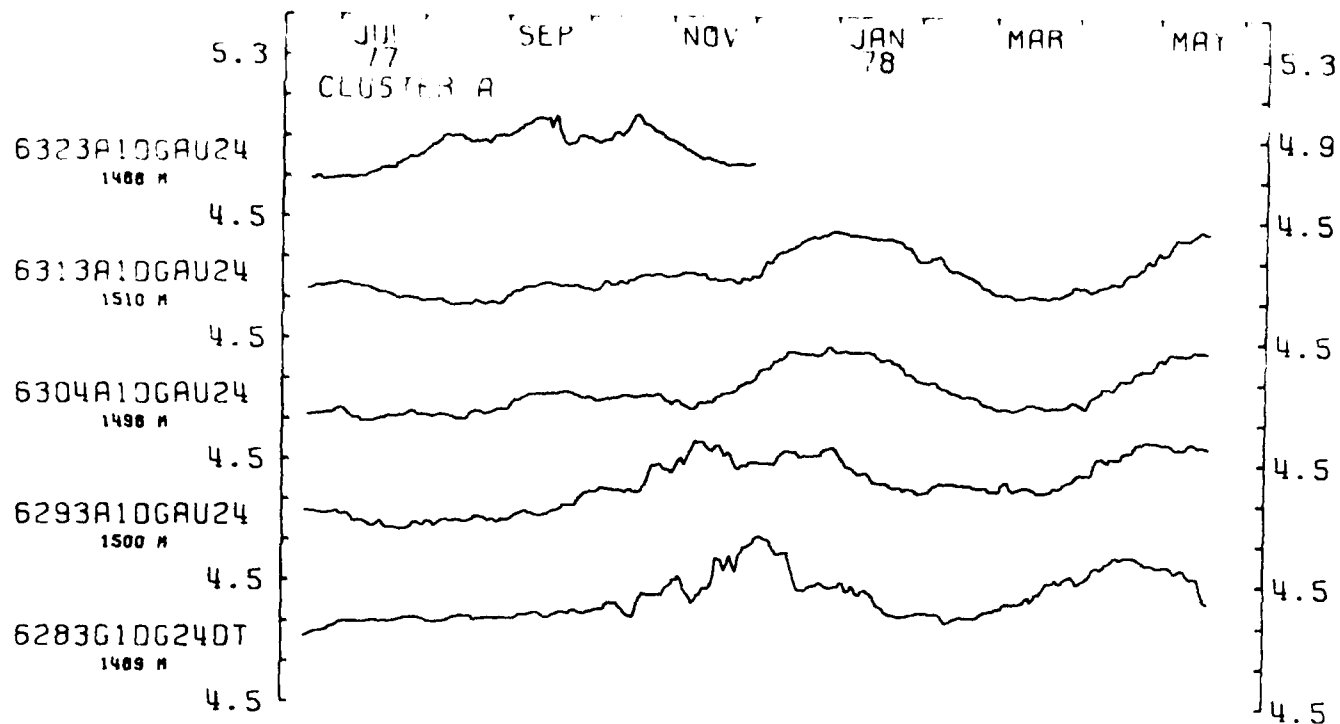


NORTH COMPONENTS AT 1500M. DEPTH. UNITS OF 2.5 CM/SEC



TEMPERATURES AT 1500M. DEPTH

UNITS OF .2 C.



NORTH IS UP 1500M. DEPTH, UNITS OF 2.5 CM/SEC

JUN AUG OCT DEC FEB APR
 77 78
 CLUSTER A

6323A10GAU24
 1488 M



6313A10GAU24
 1510 M



6304A10GAU24
 1488 M



6293A10GAU24
 1500 M



6283G10GAU24
 1489 M



CLUSTER B

6273A10GAU24
 1505 M



6263A10GAU24
 1514 M



6253A10GAU24
 1488 M



6243A10GAU24
 1528 M

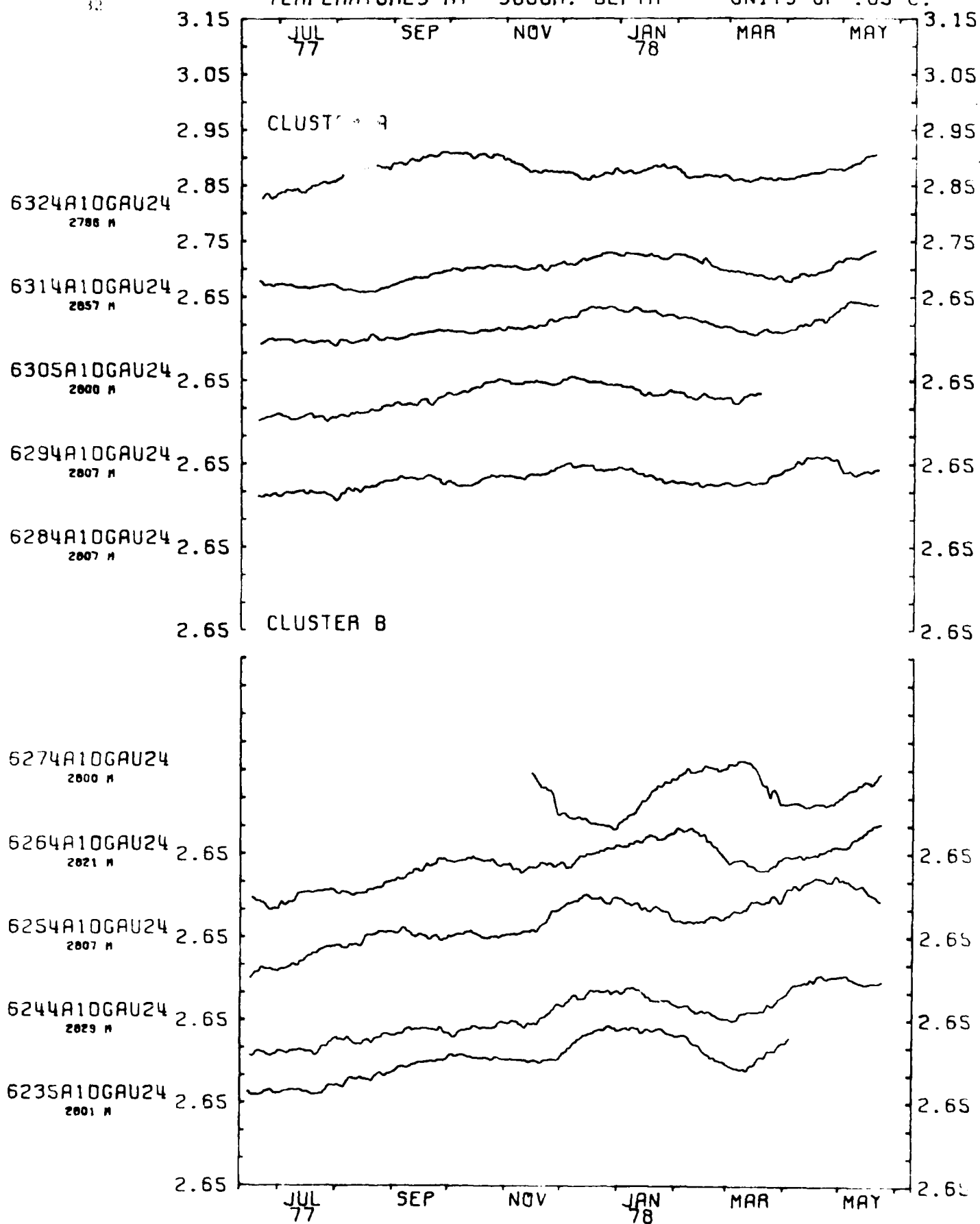


6234A10GAU24
 1426 M



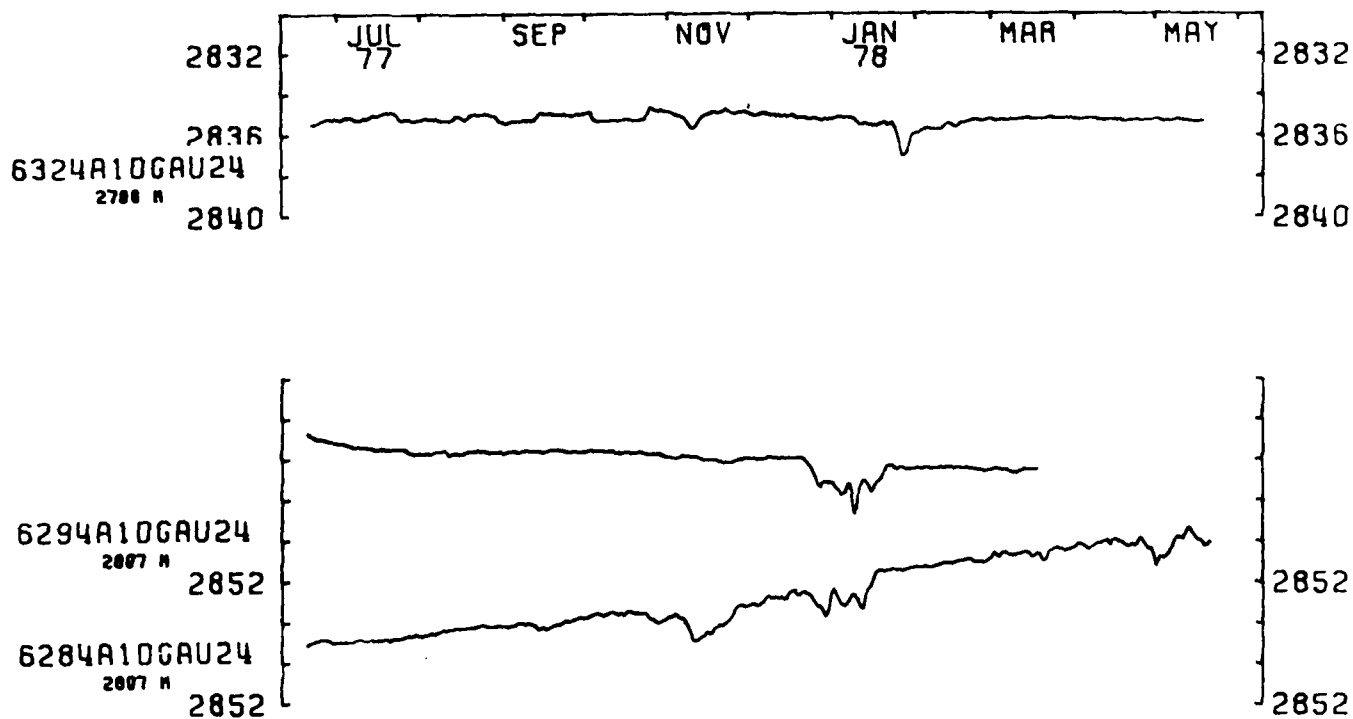
JUN AUG OCT DEC FEB APR
 77 78

UNITS OF .05 C.

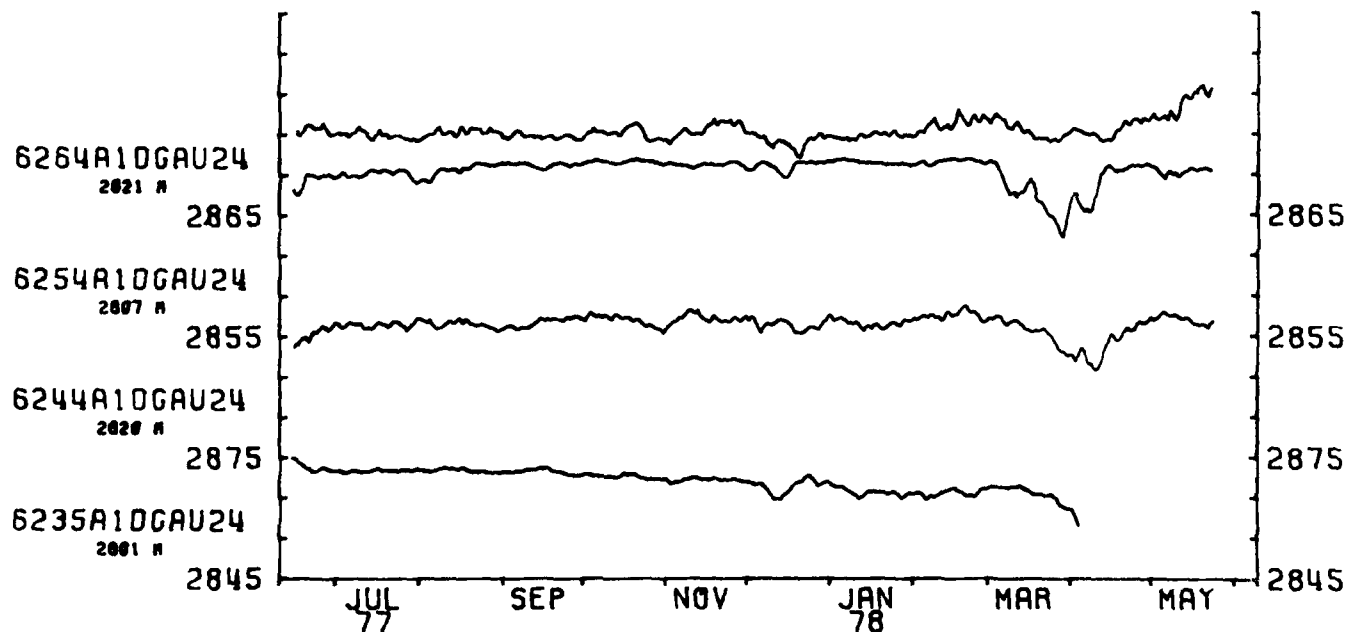


PRESSURES AT 3000M. DEPTH UNITS OF 2 DBS.

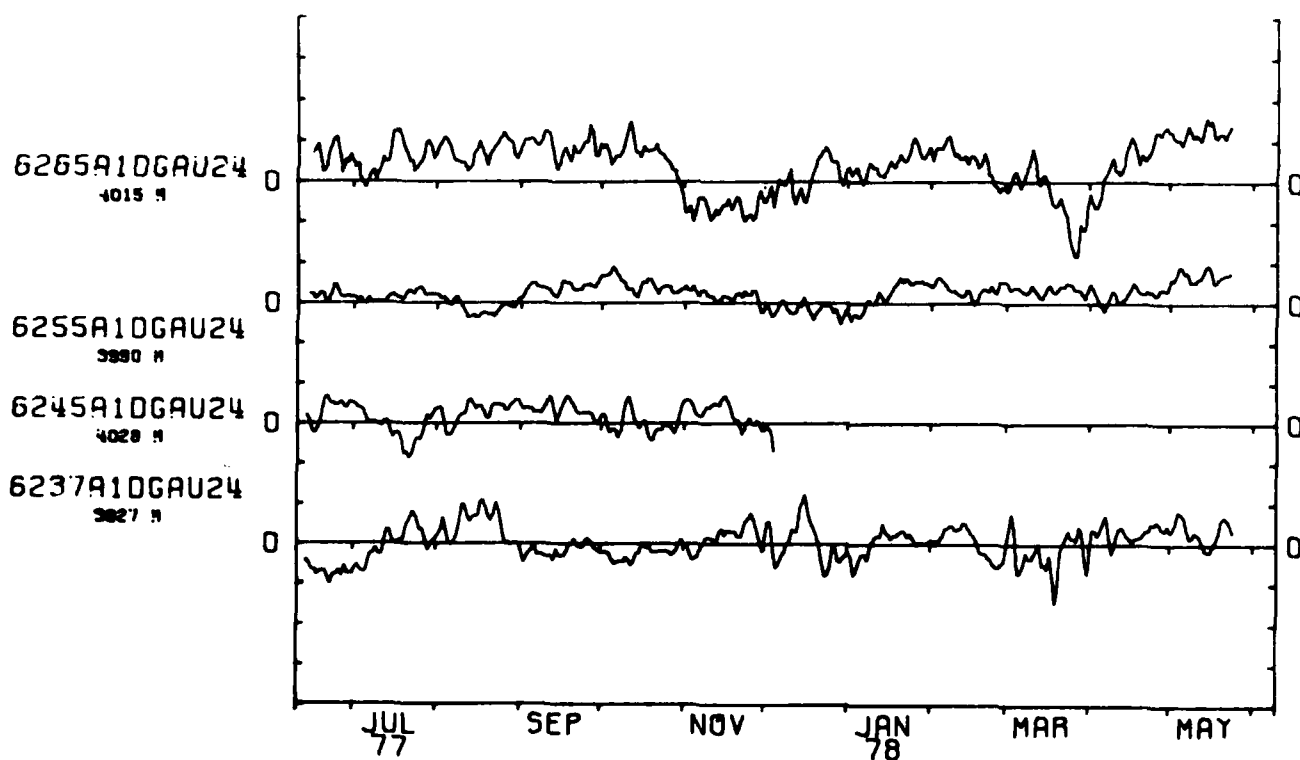
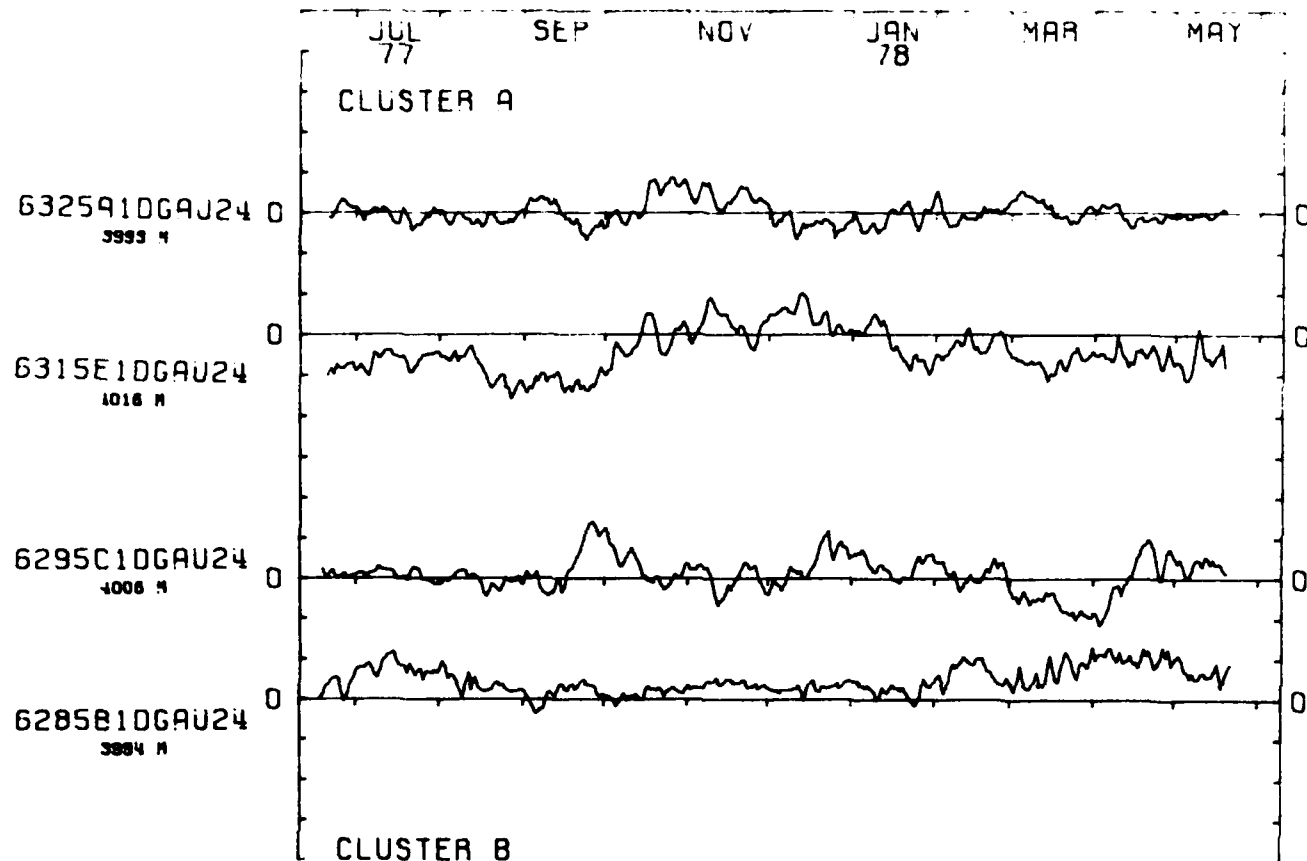
CLUSTER A



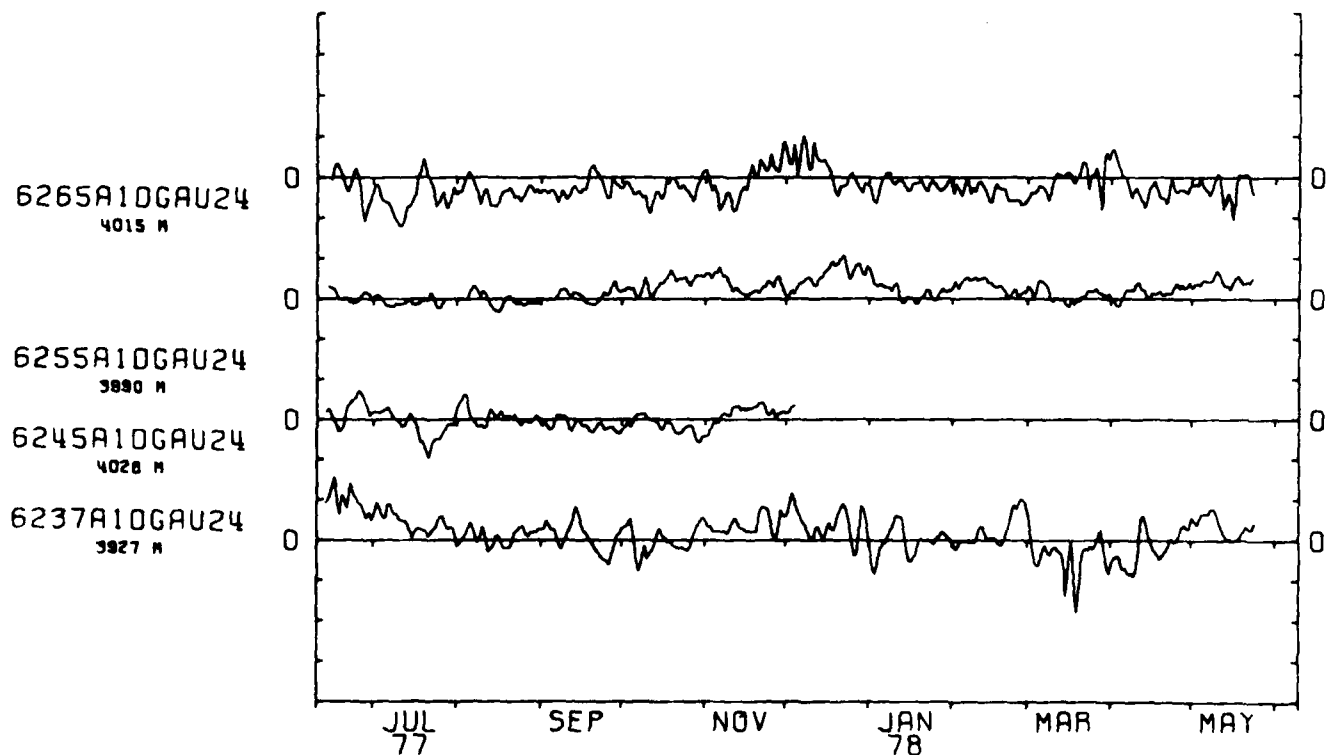
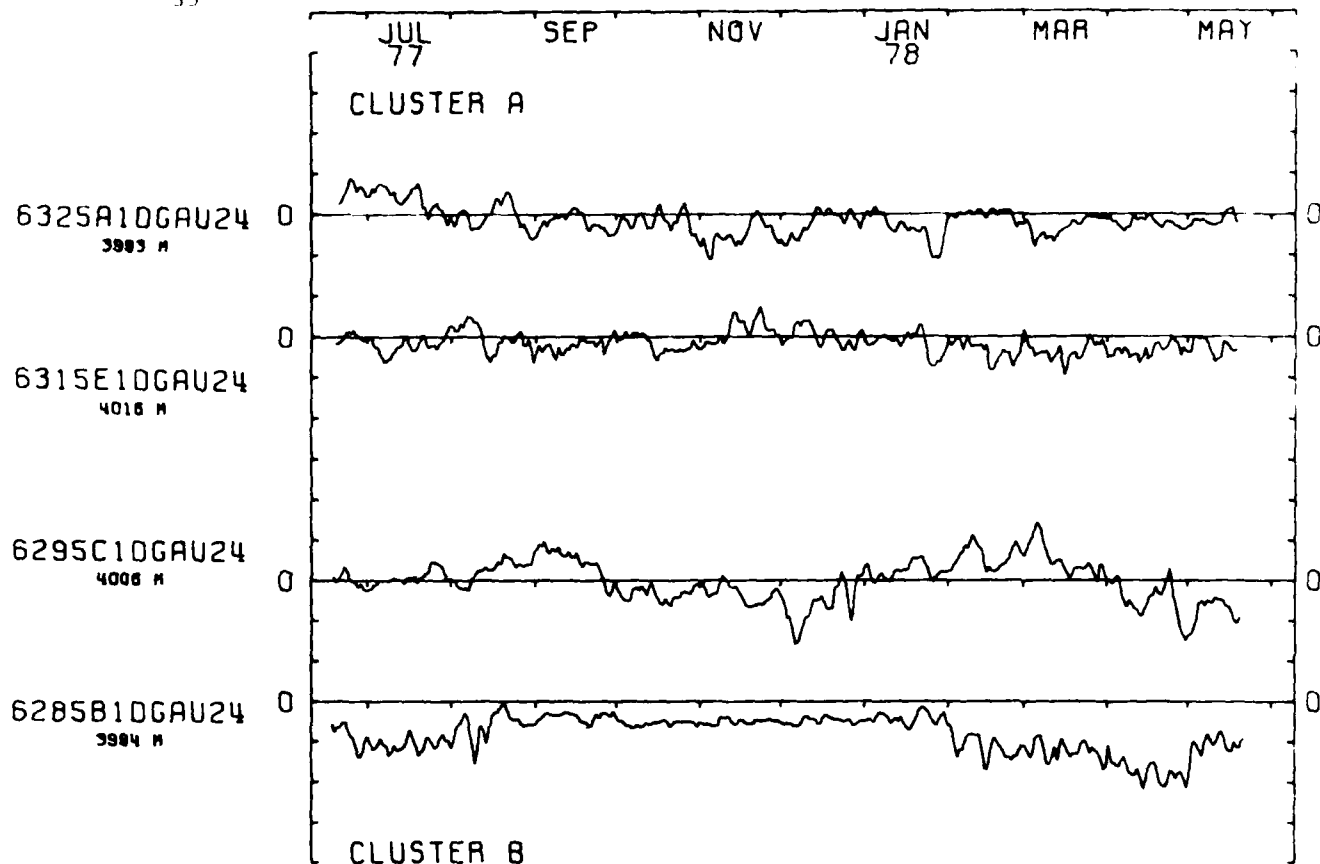
CLUSTER B



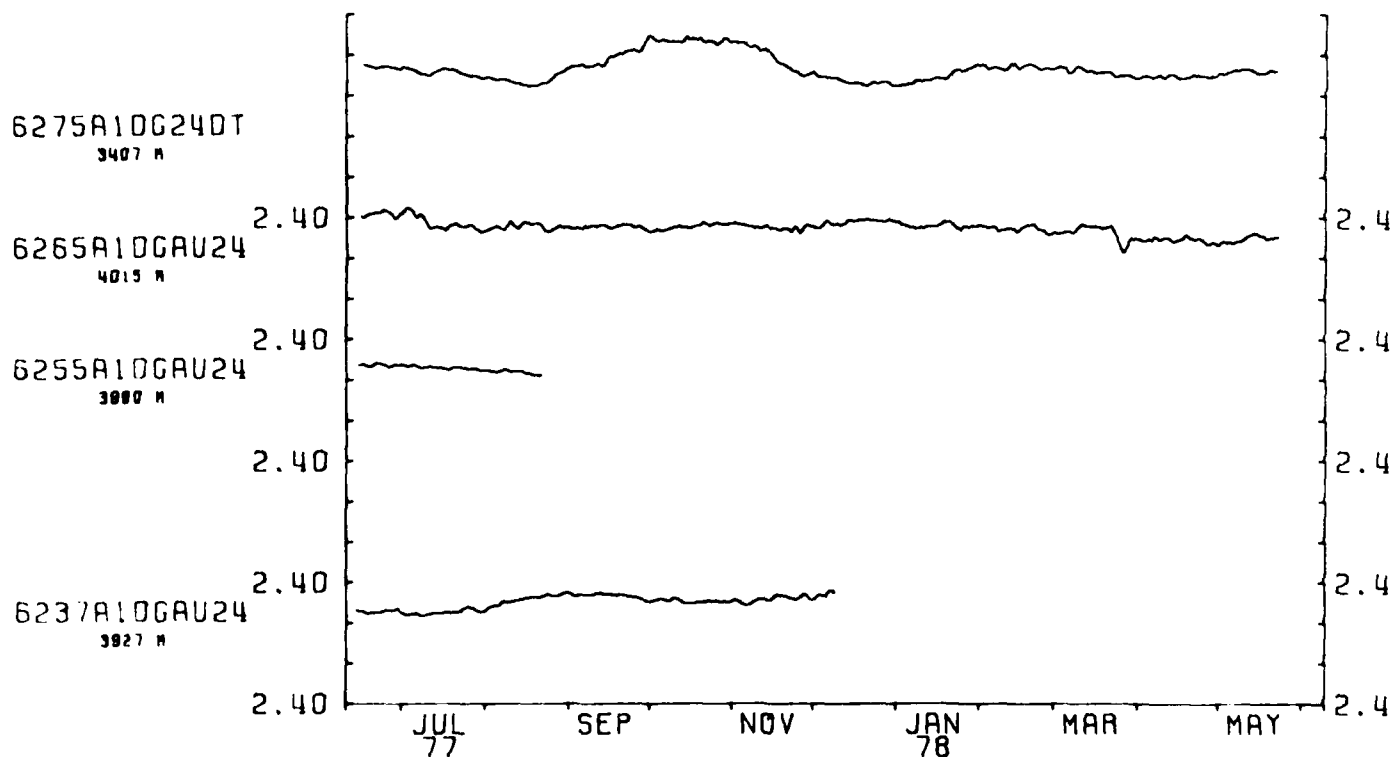
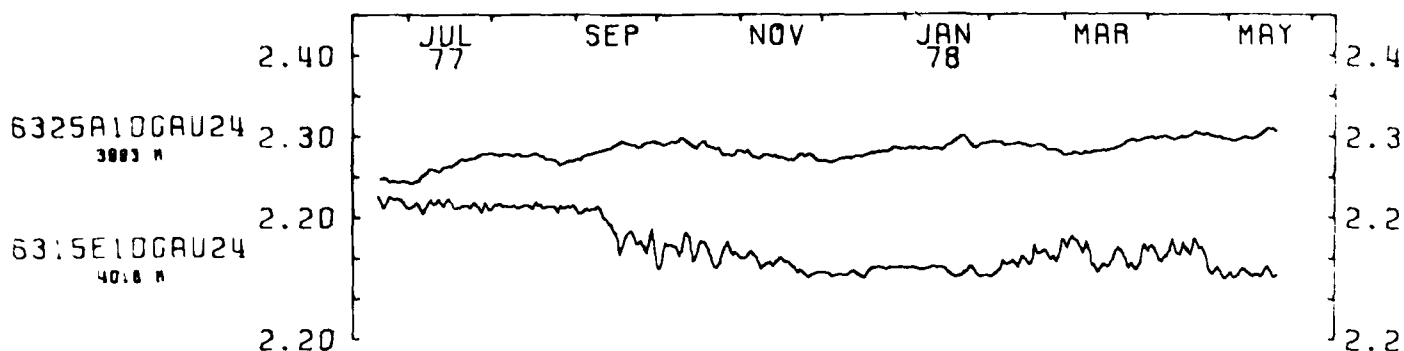
EAST COMPONENTS AT 4000M. DEPTH. UNITS OF 2.5 CM/SEC



NORTH COMPONENTS AT 4000M. DEPTH. UNITS OF 2.5 CM/SEC



TEMPERATURES AT 4000M. DEPTH UNITS OF .05 C.
CLUSTER A



NORTH IS UP 4000M. DEPTH. UNITS OF 2.5 CM/SEC

JUN AUG OCT DEC FEB 78 APR

CLUSTER A

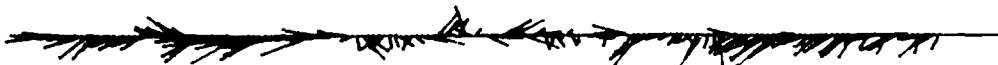
6325A10GAU24

3893 M



6315E10GAU24

4018 M



6295C10GAU24

4008 M



6285B10GAU24

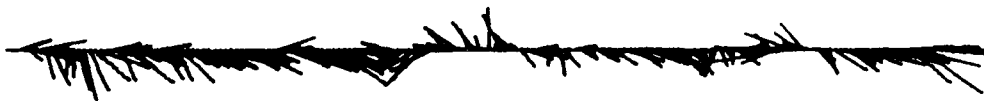
3894 M



CLUSTER B

6265A10GAU24

4018 M



6255A10GAU24

3890 M



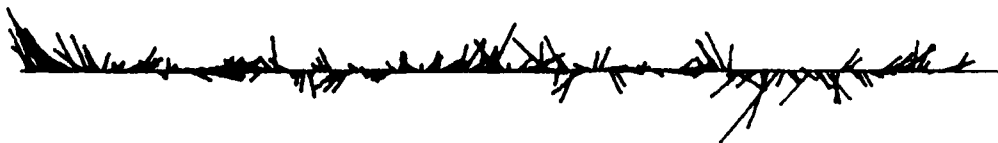
6245A10GAU24

4028 M

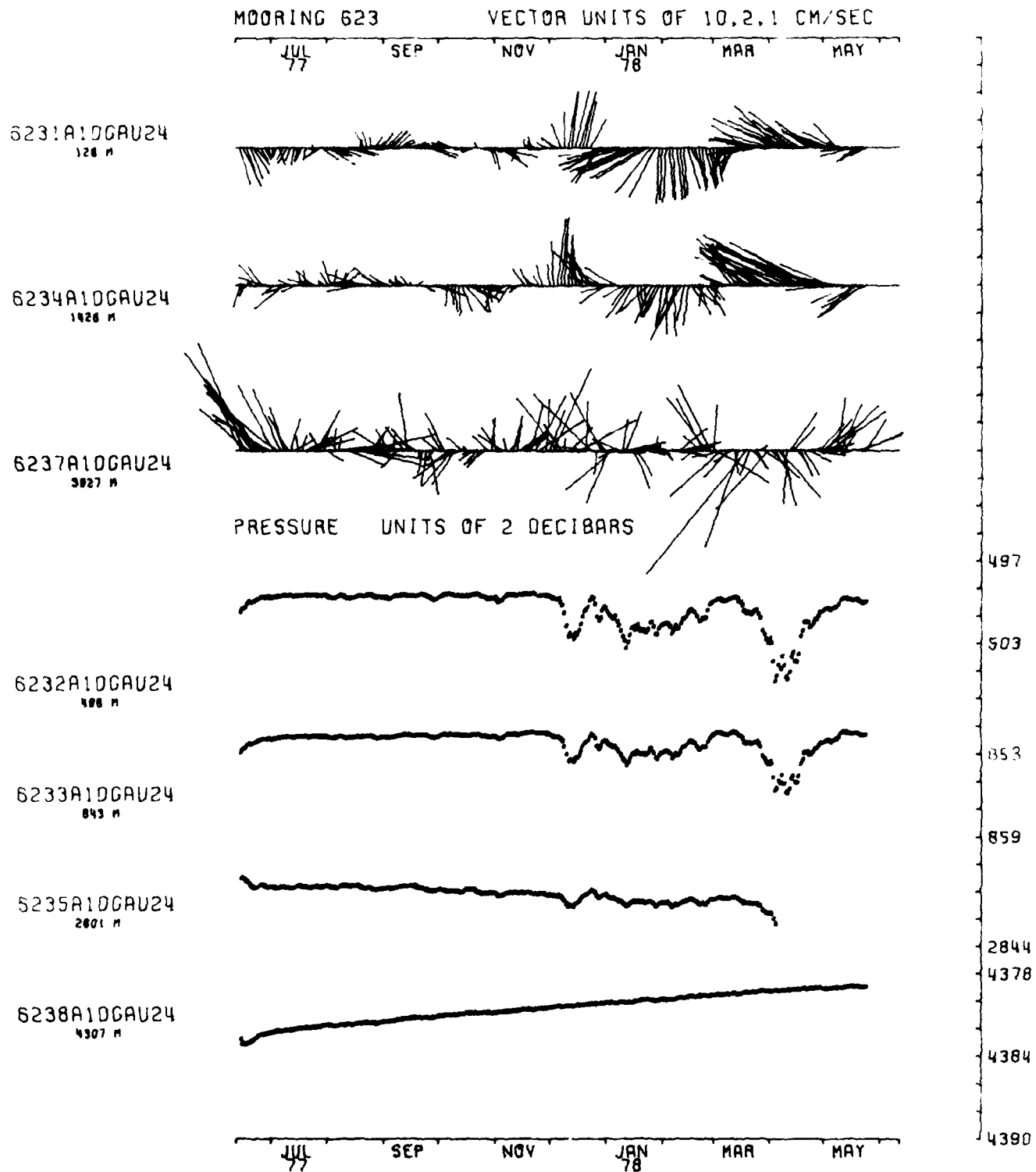


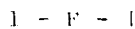
6237A10GAU24

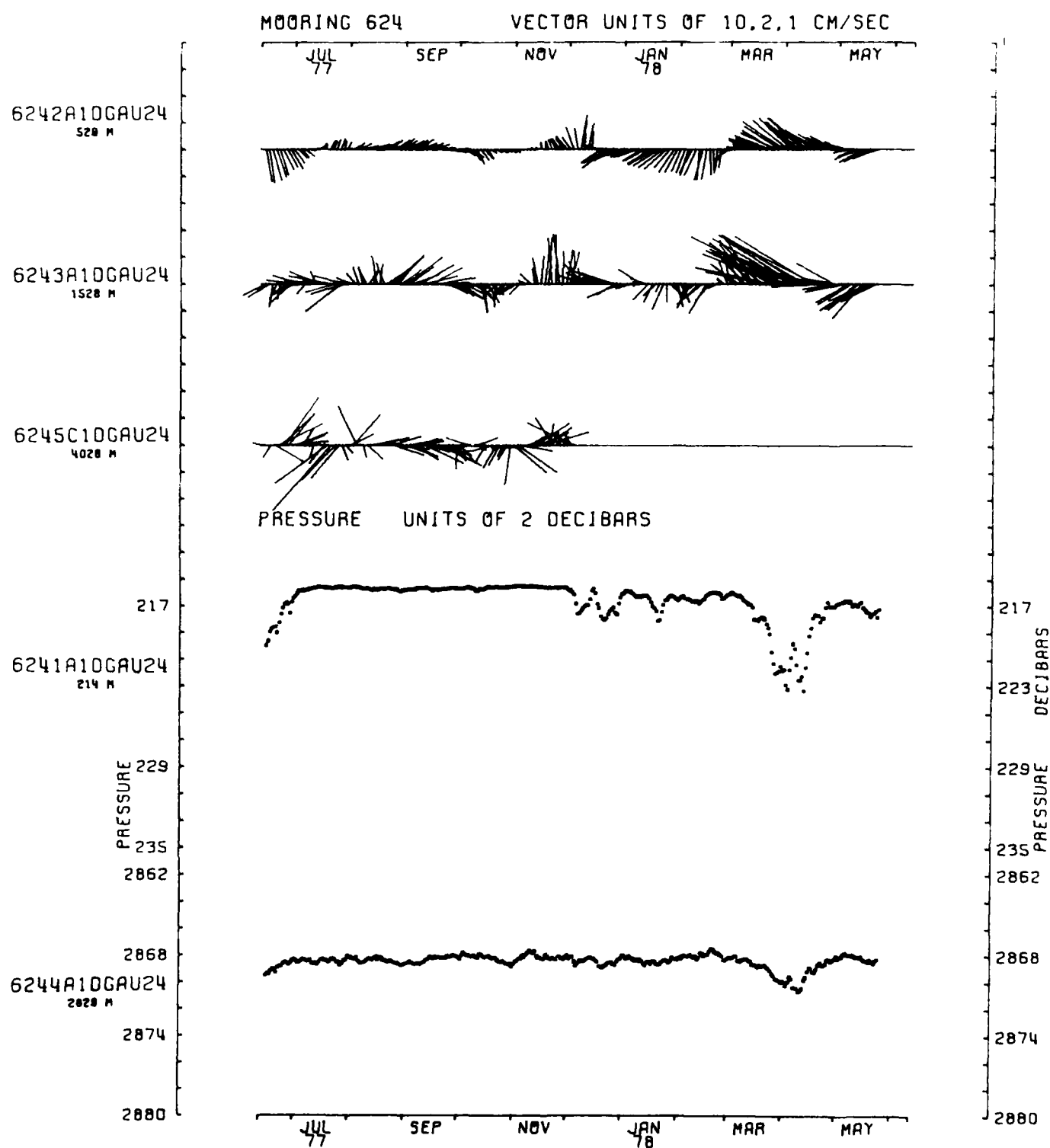
3827 M

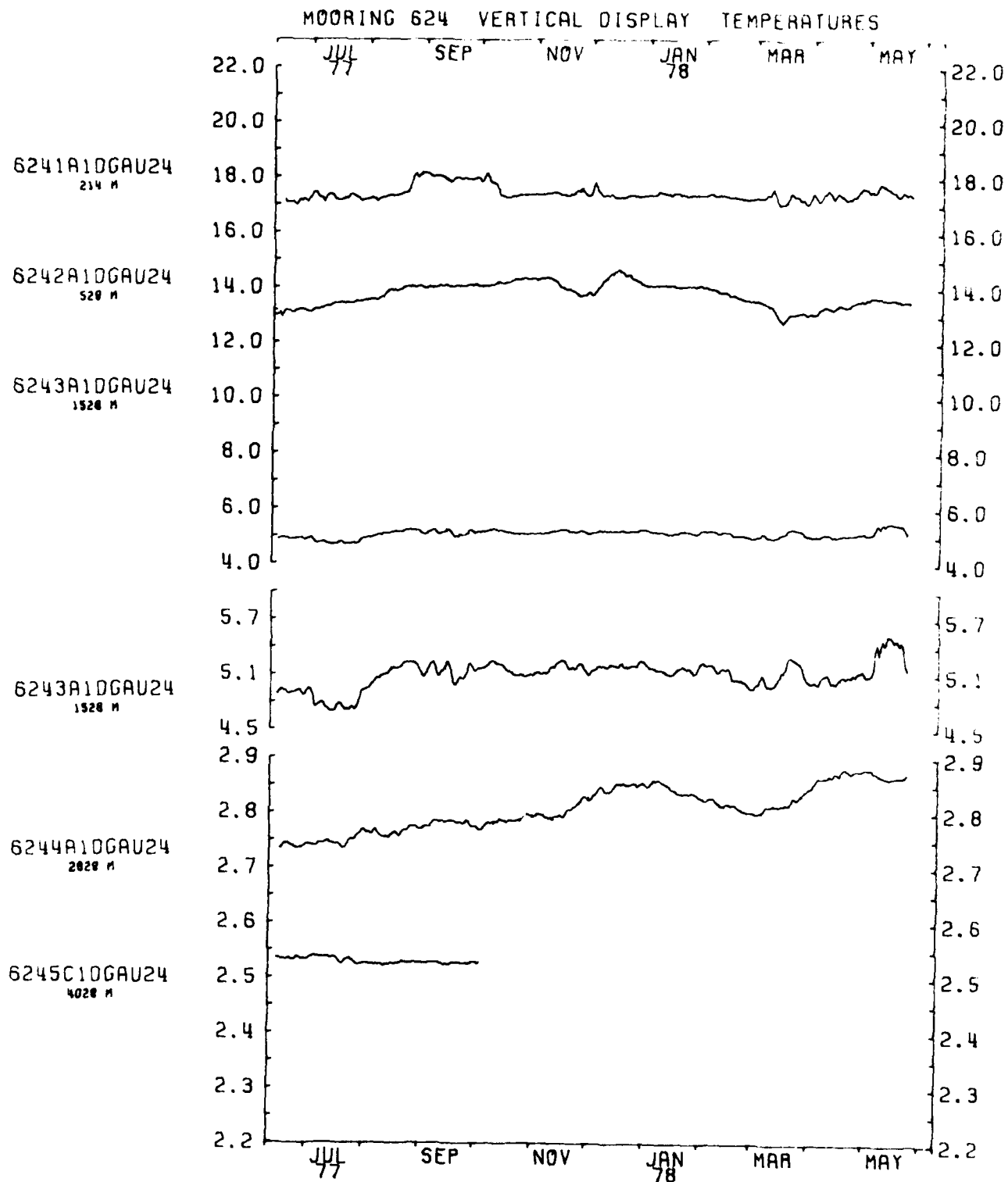


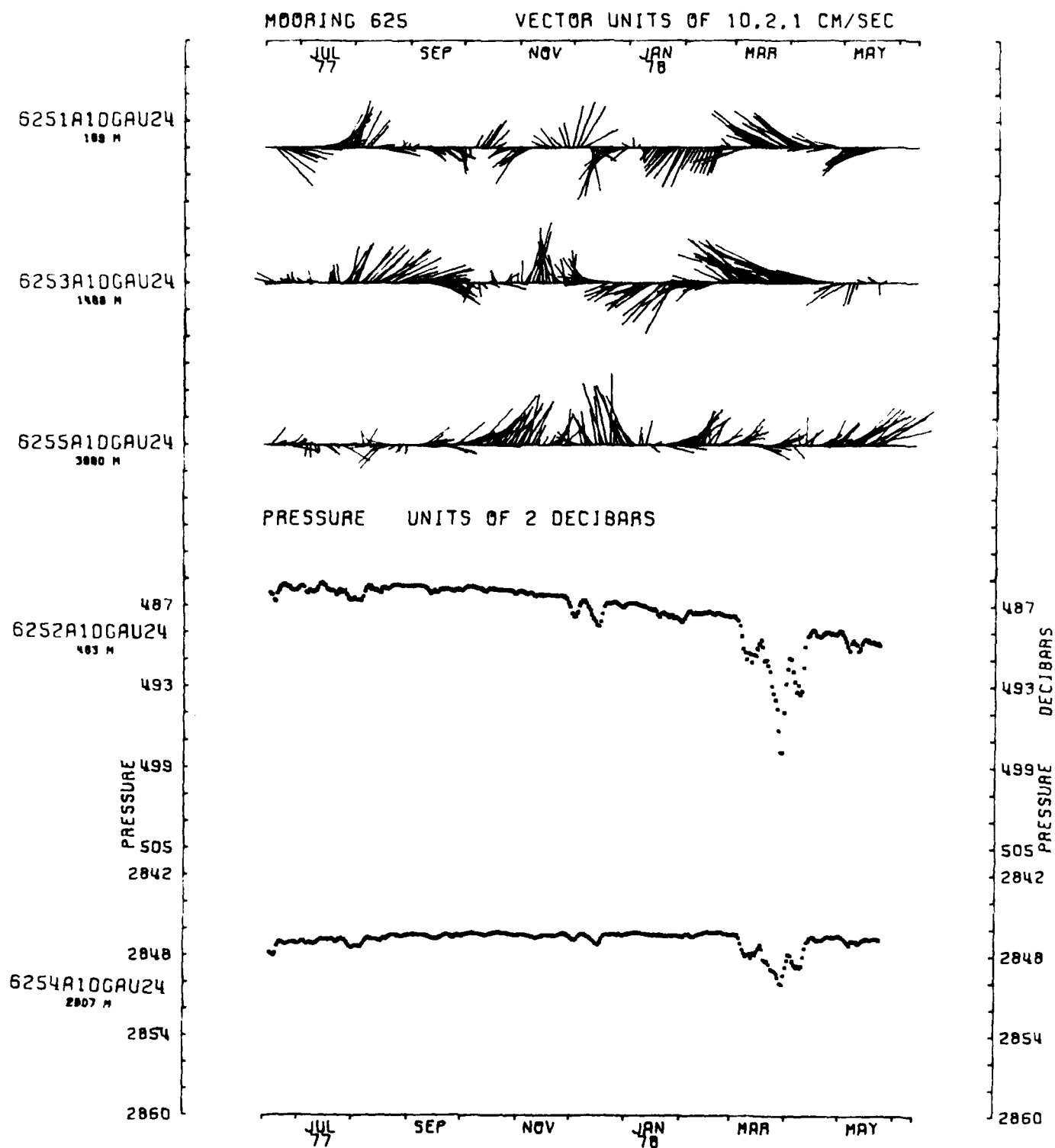
JUN AUG OCT DEC FEB 78 APR

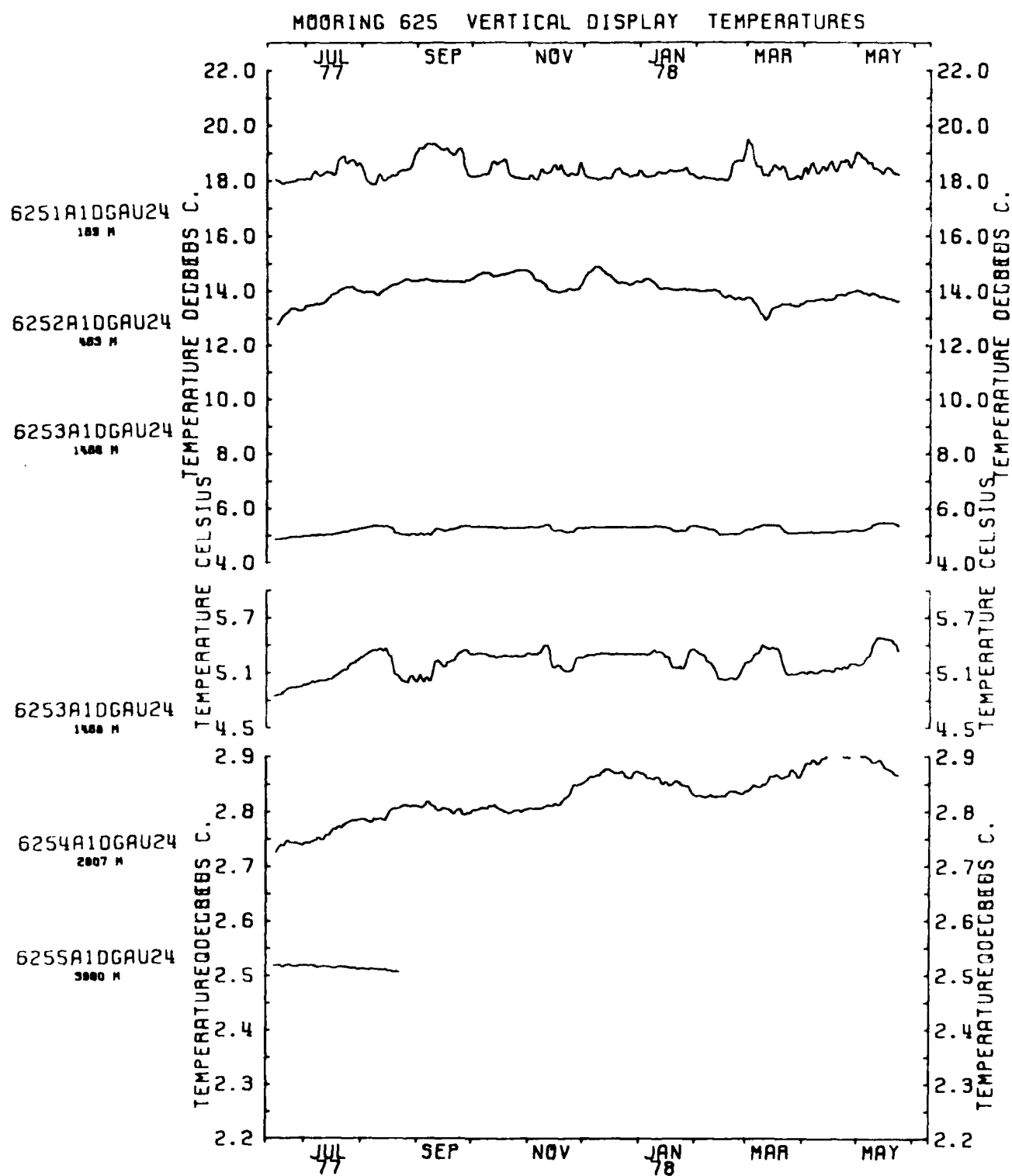


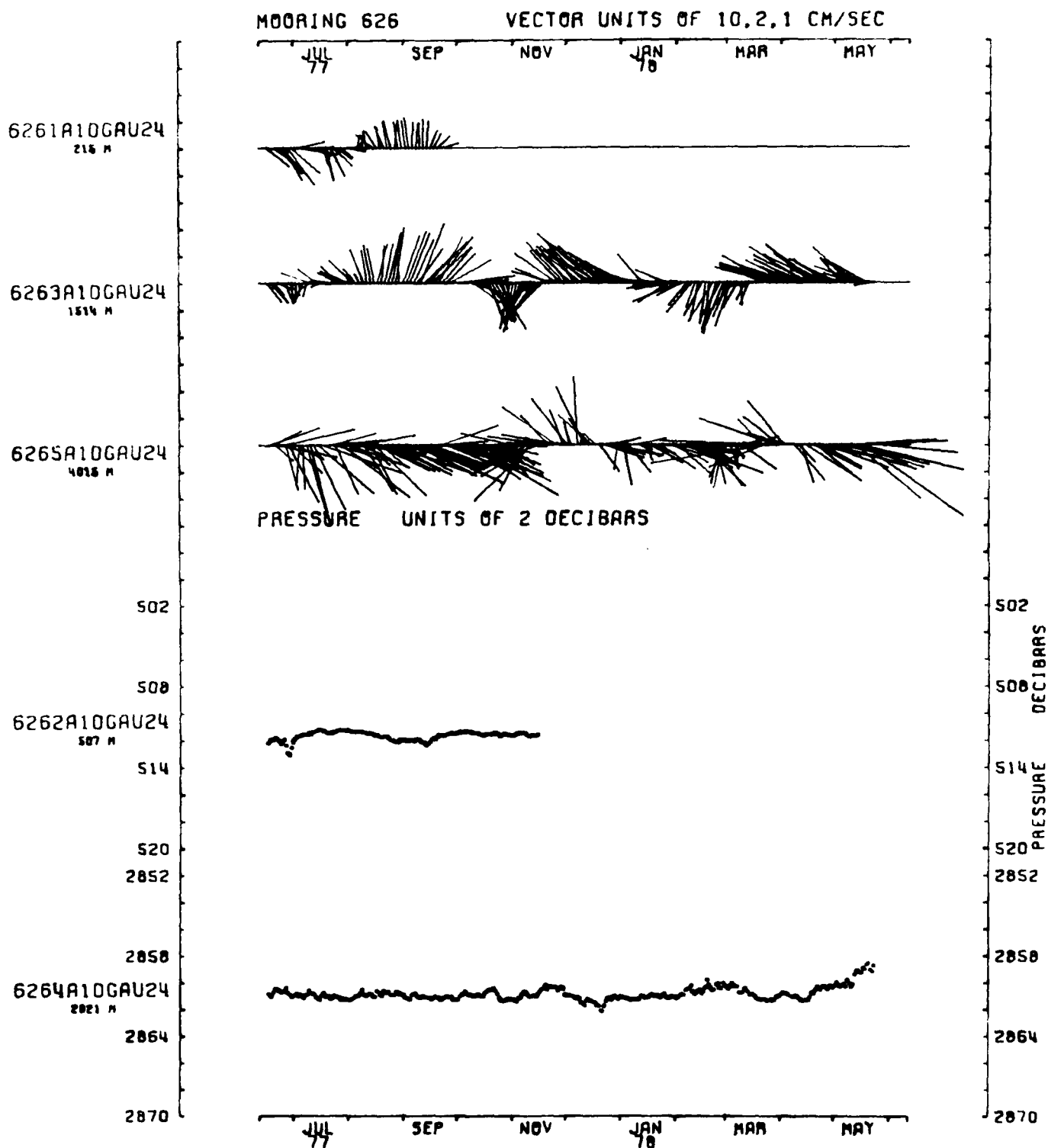




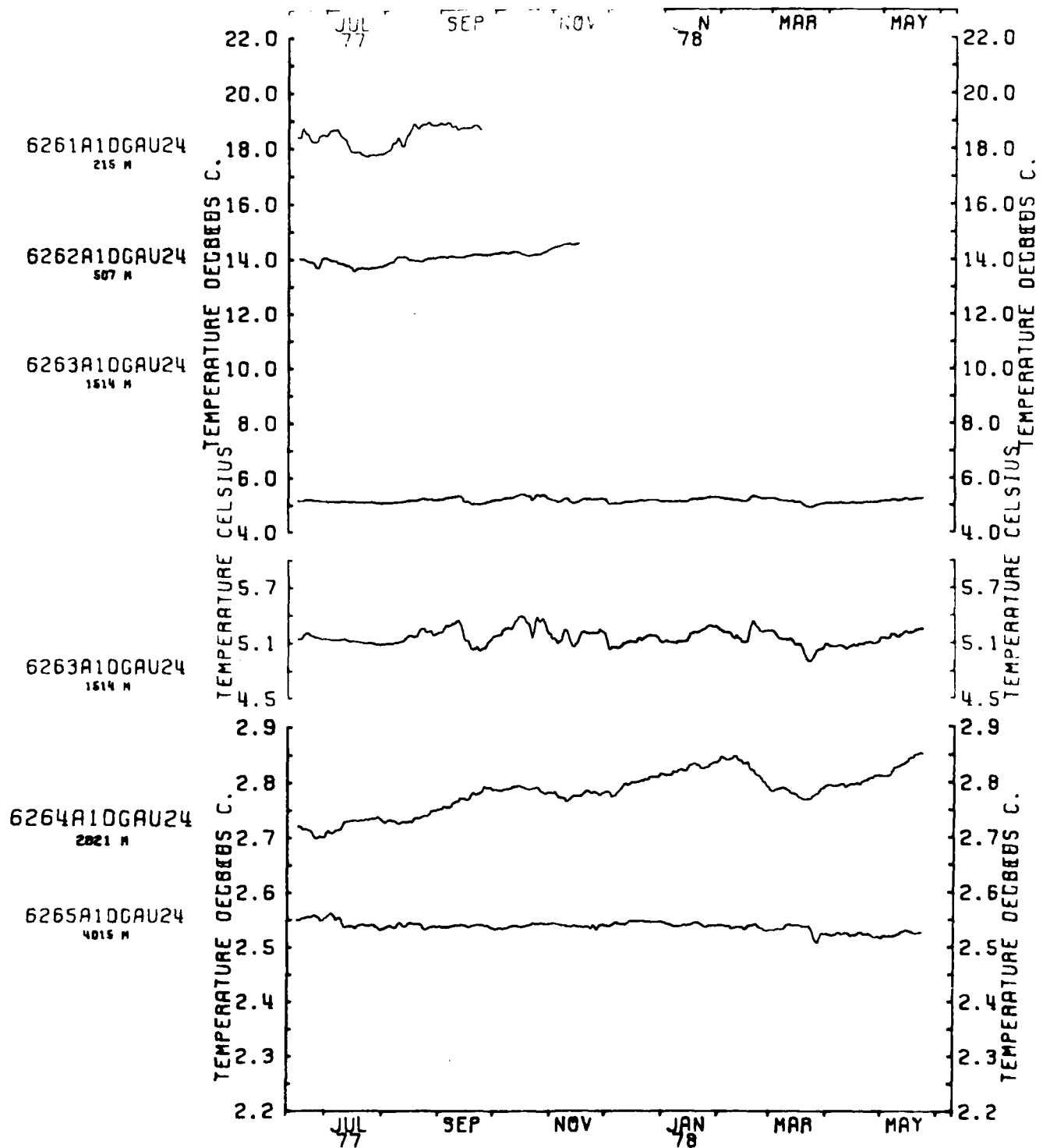


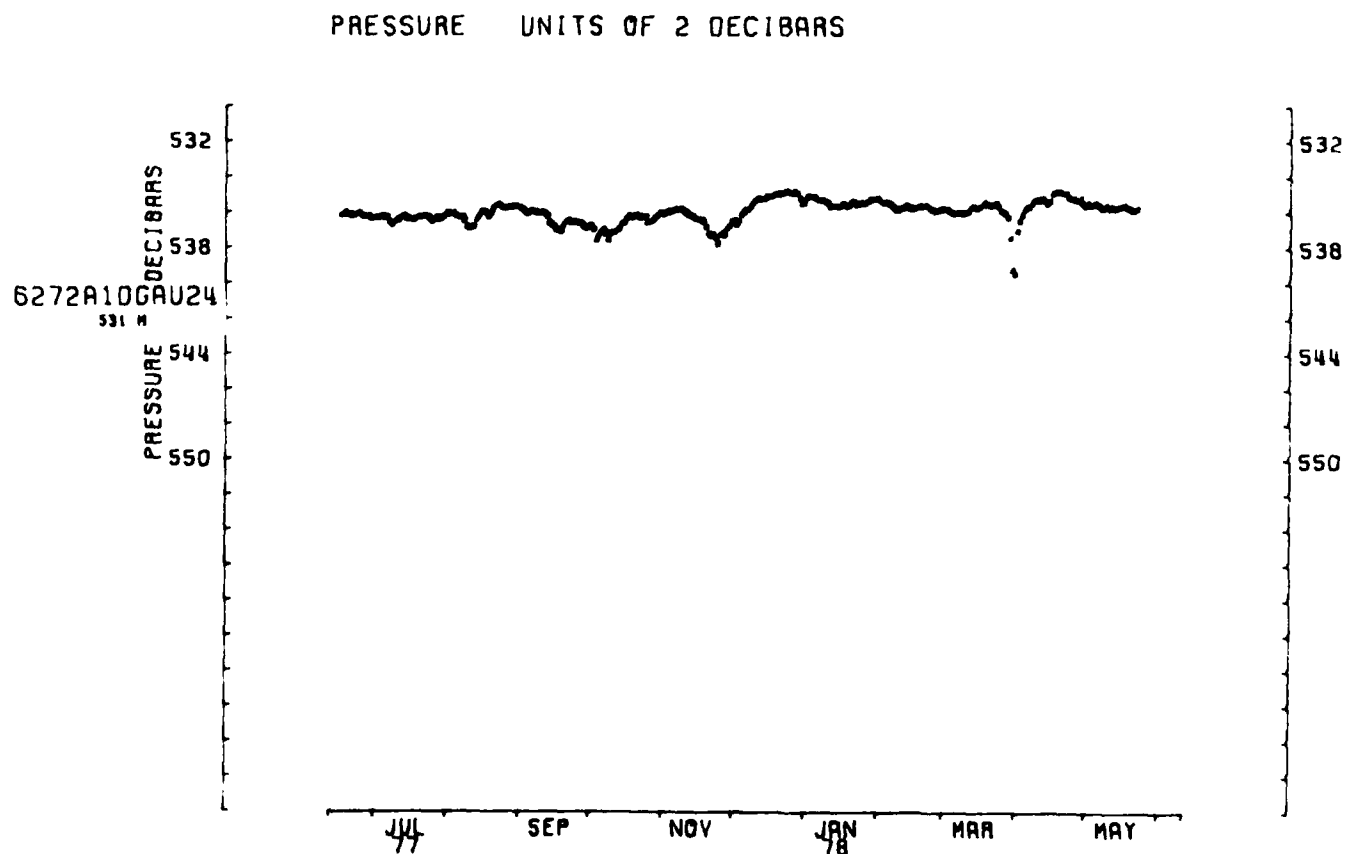
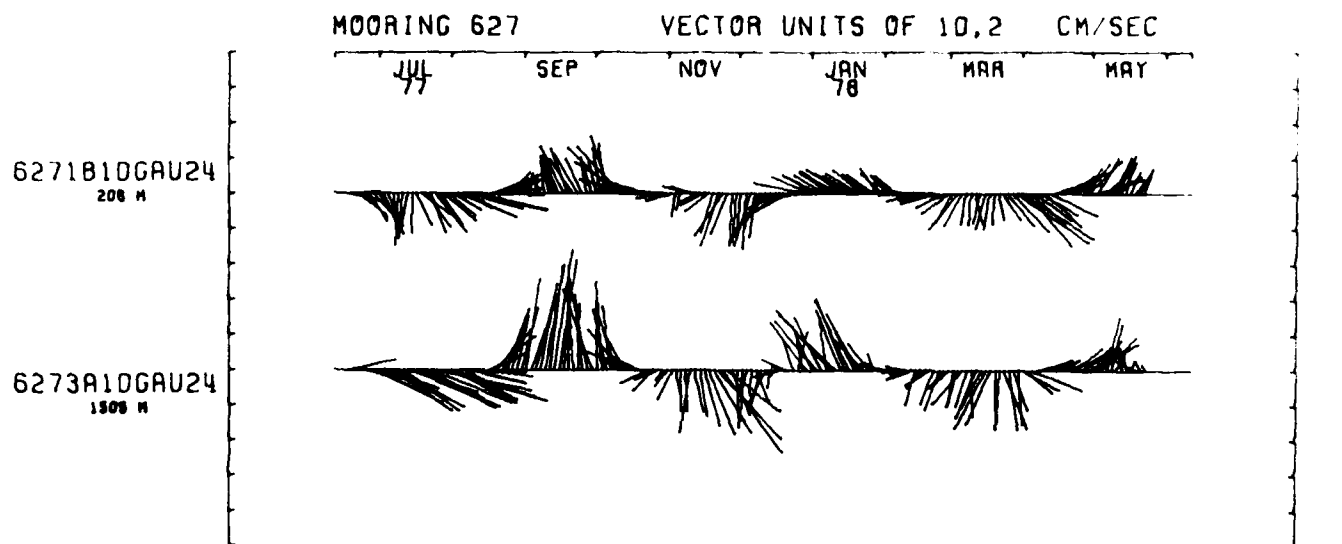


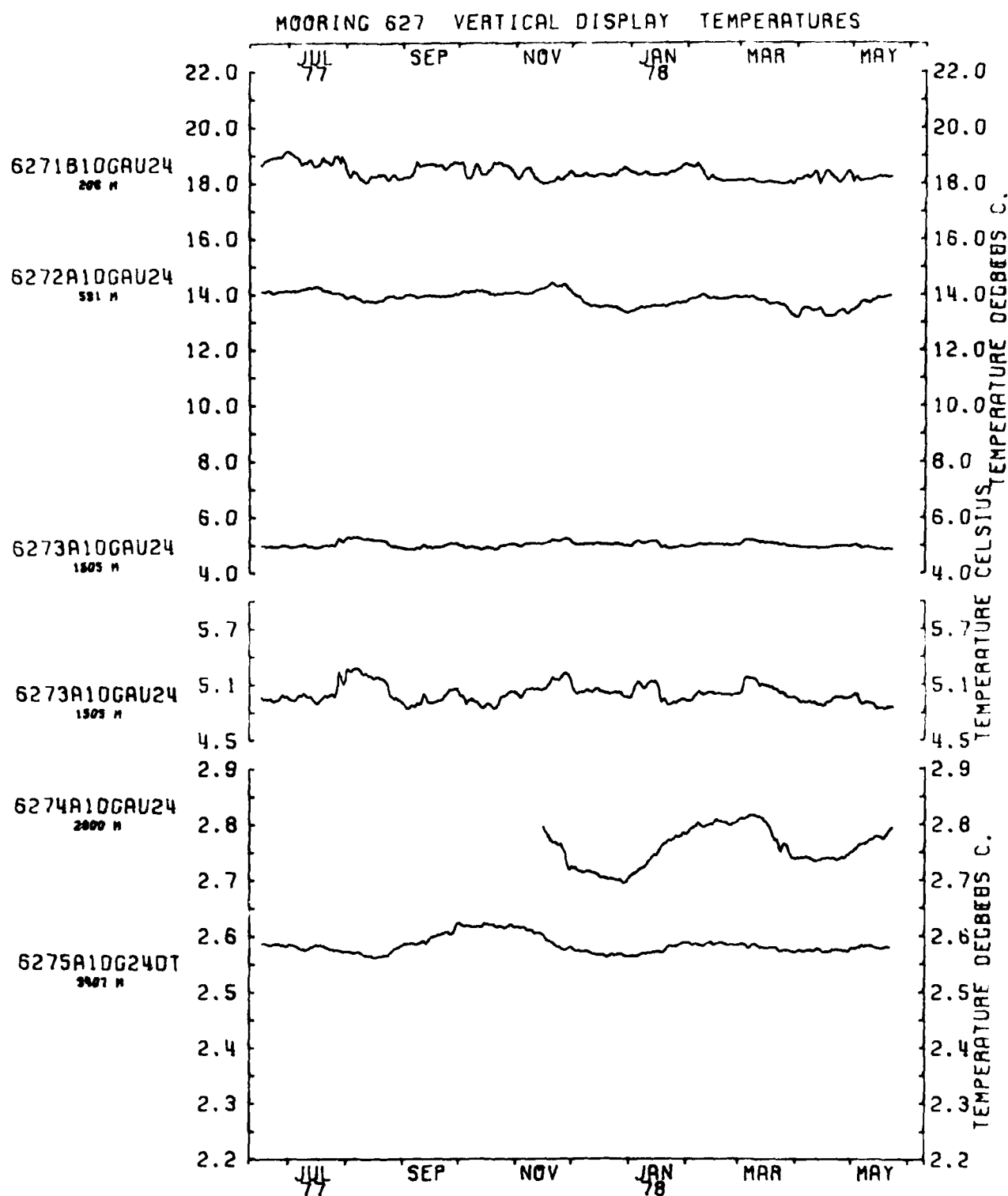


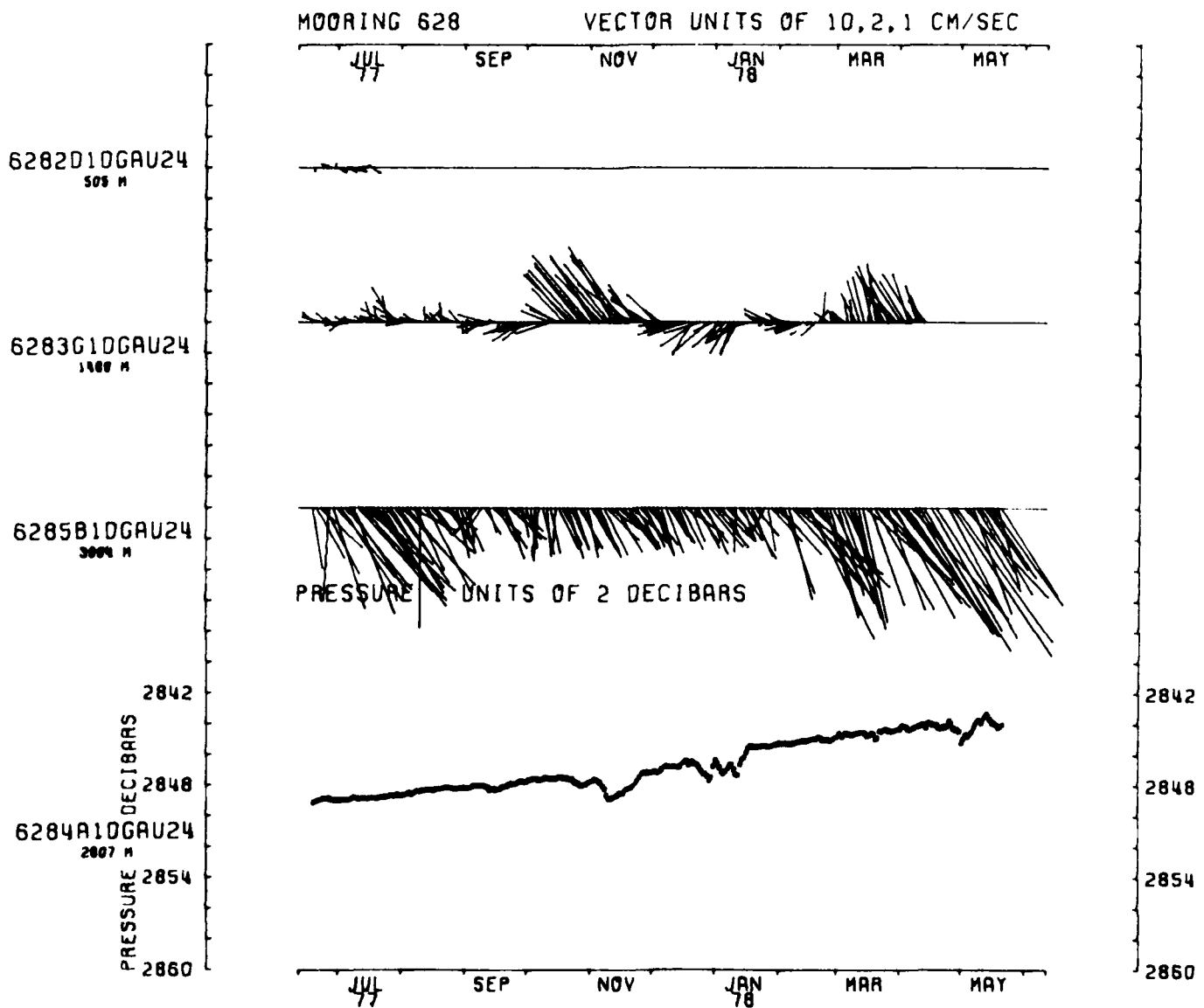


MOORING 626 VERTICAL DISPLAY TEMPERATURES

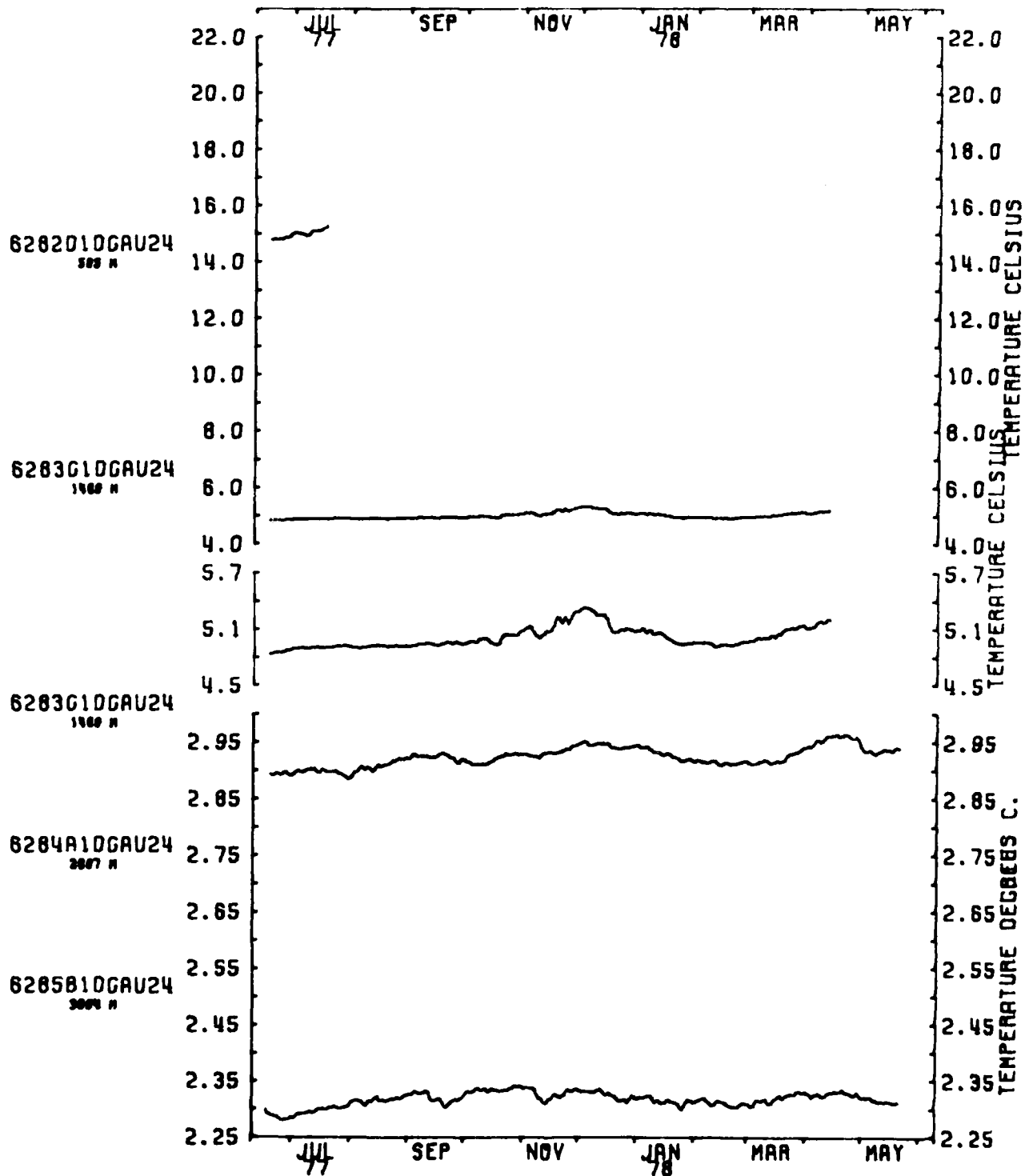


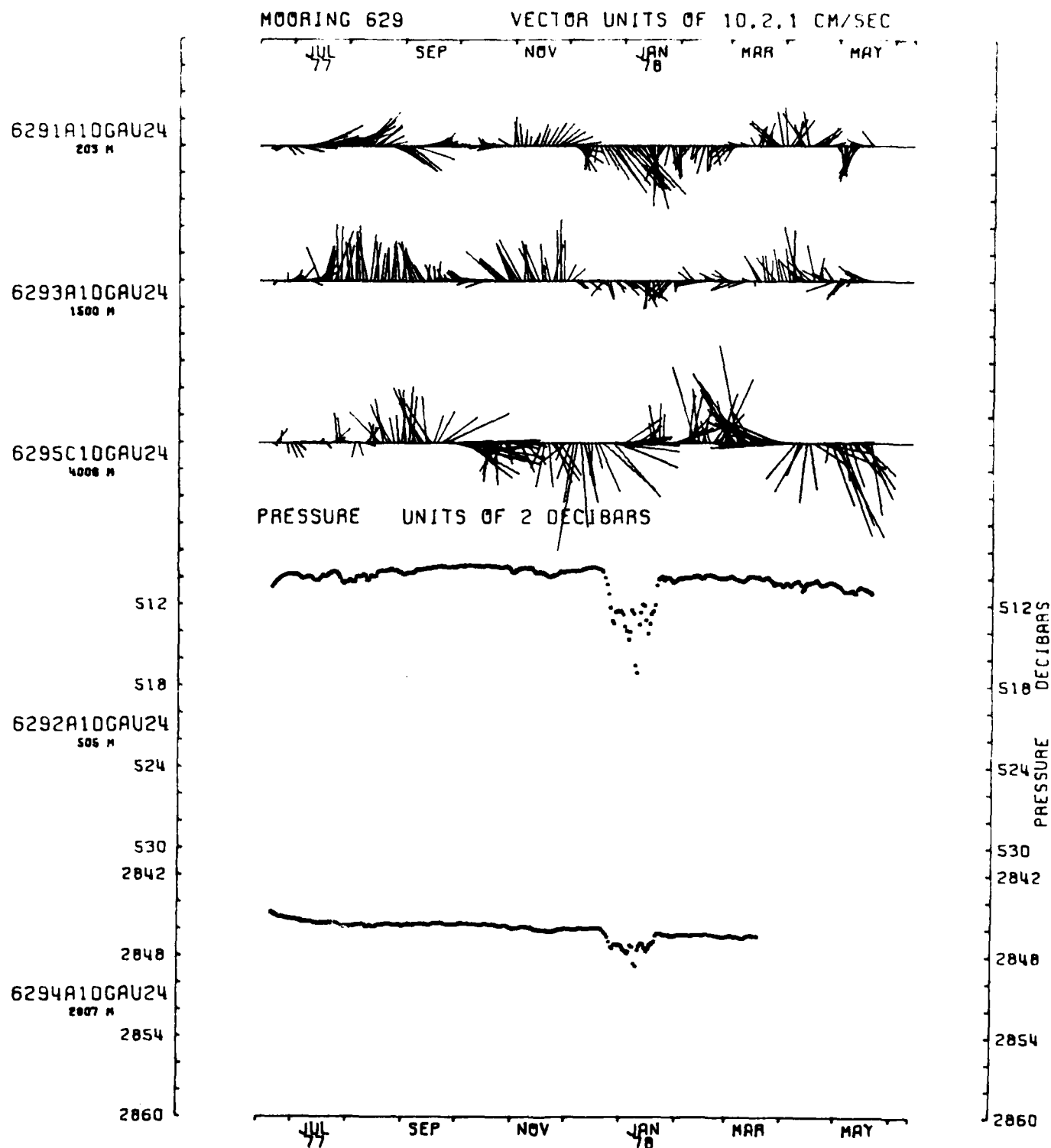


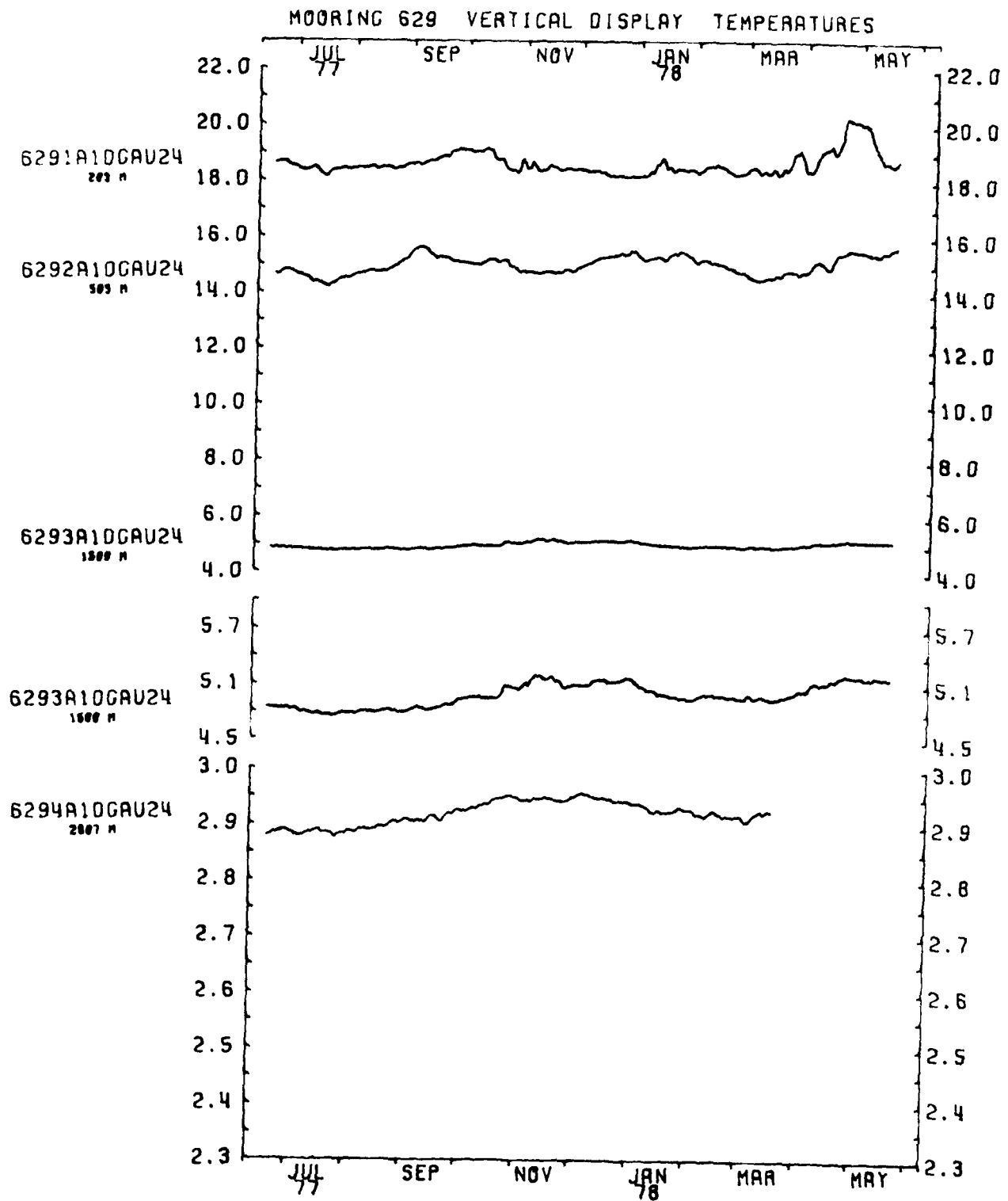




MOORING 628 VERTICAL DISPLAY TEMPERATURES

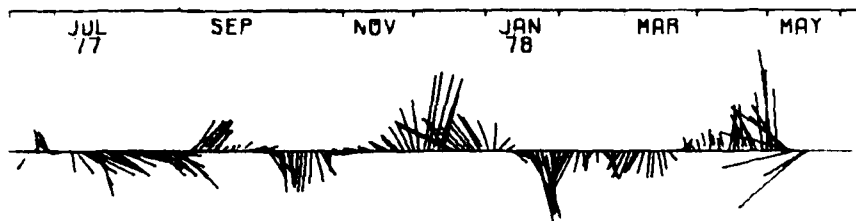






MOORING 630

VECTOR UNITS OF 10.2 CM/SEC

6301810GAU24
200 M6304810GAU24
400 M

PRESSURE UNITS OF 2 DECIBARS

6302810GAU24
542 M

542

548

554



542

548

554

6306810GAU24
3450 M

3554

3560

4998



3554

3560

4998

6308810GAU24
4800 M

5004

5010



5004

5010

JUL
77

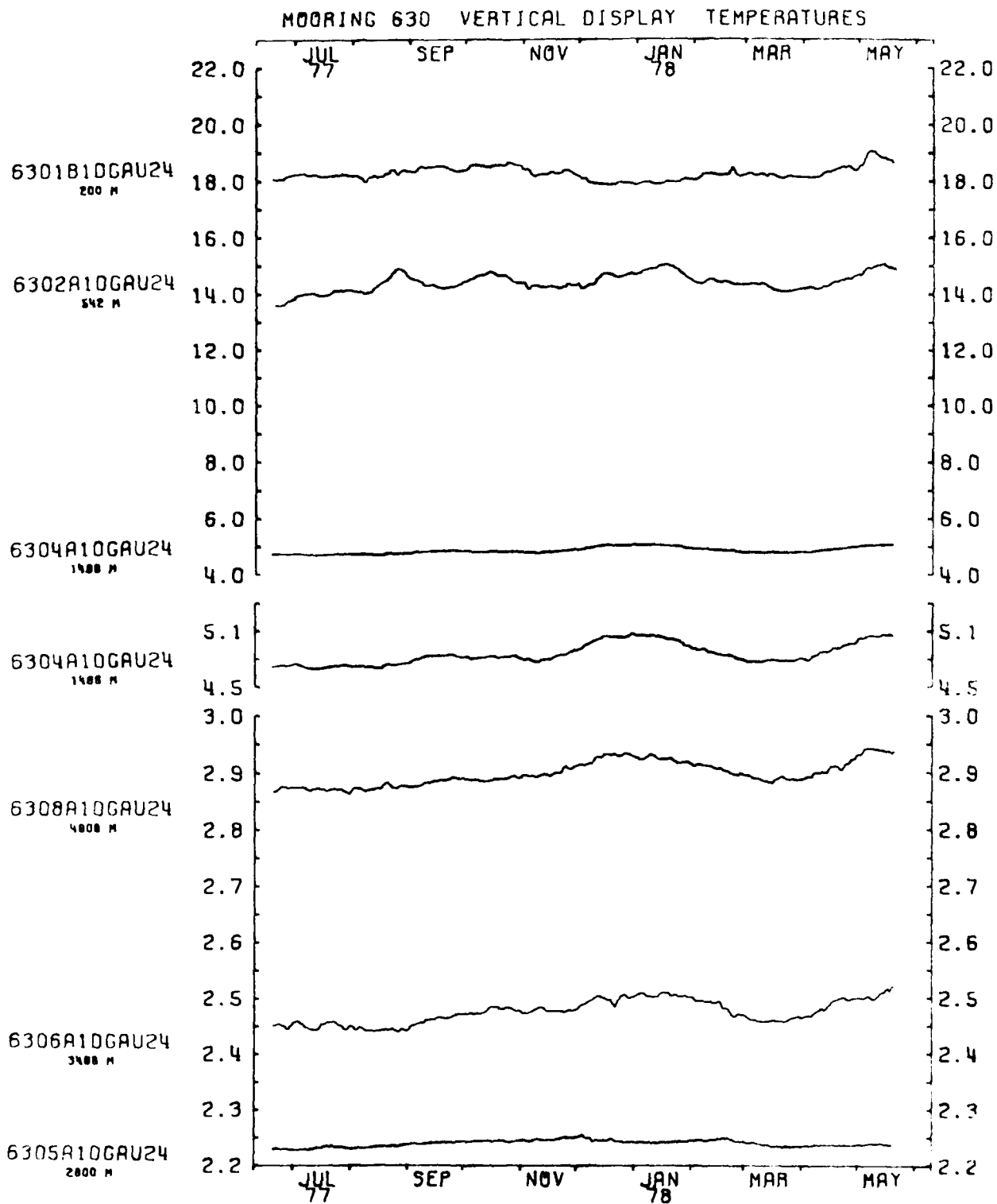
SEP

NOV

JAN
78

MAR

MAY



MOORING 631

VECTOR UNITS OF 10, 1 CM/SEC

JUL 77 SEP NOV JAN 78 MAR MAY

6311A10GAU24
212 M6315E10GAU24
4016 M

PRESSURE UNITS OF 2 DECIBARS

547

547

553

553

6312A10GAU24
546 M

559

559

2886

2886

2892

2892

6314A10GAU24
2857 M

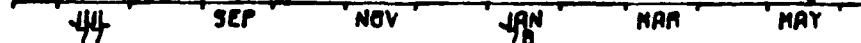
2898

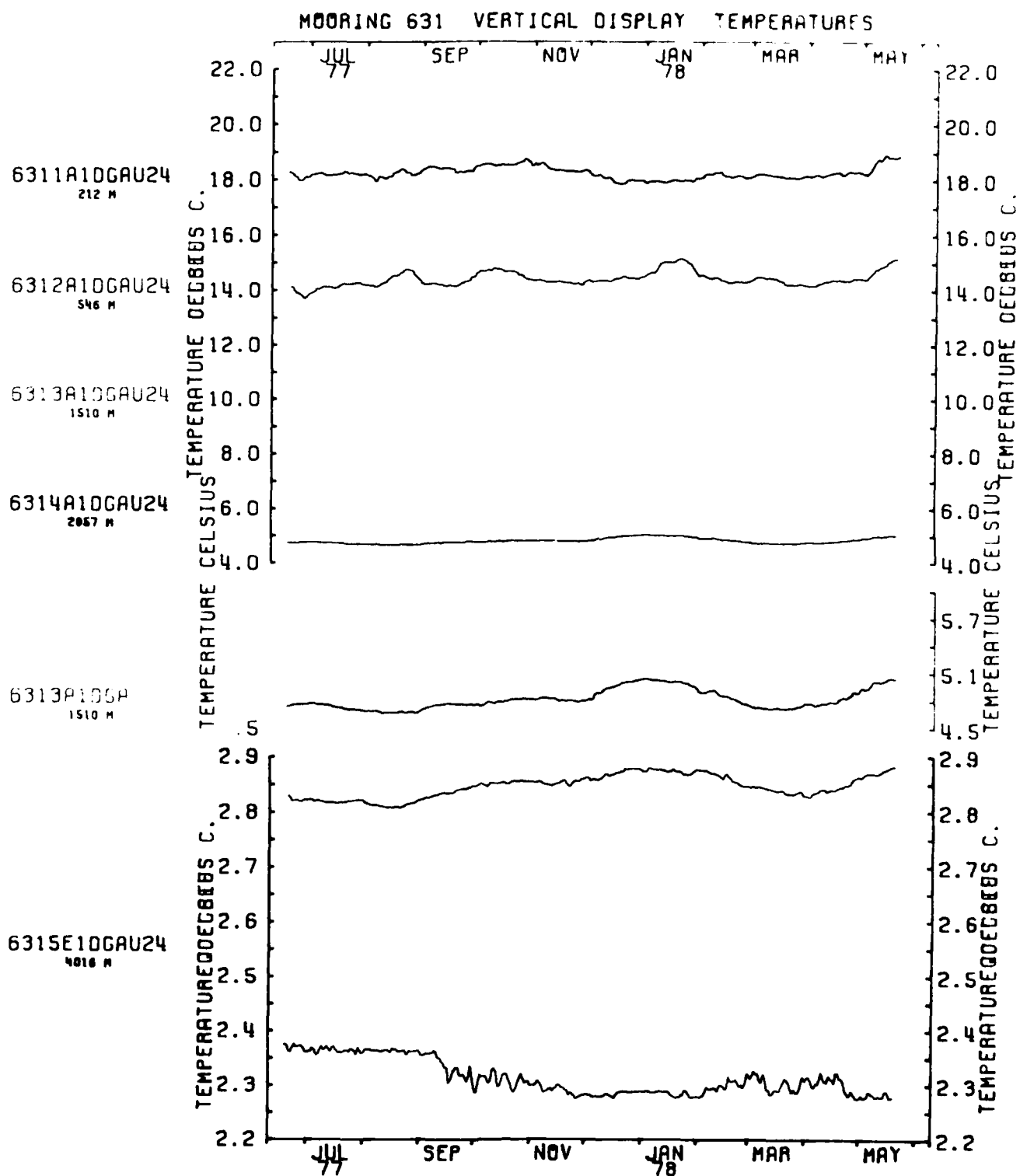
2898

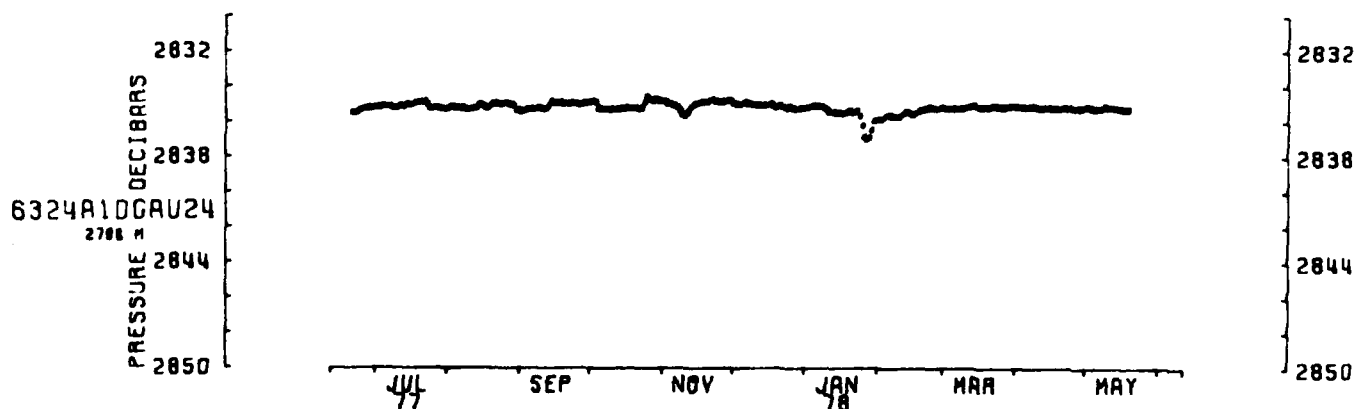
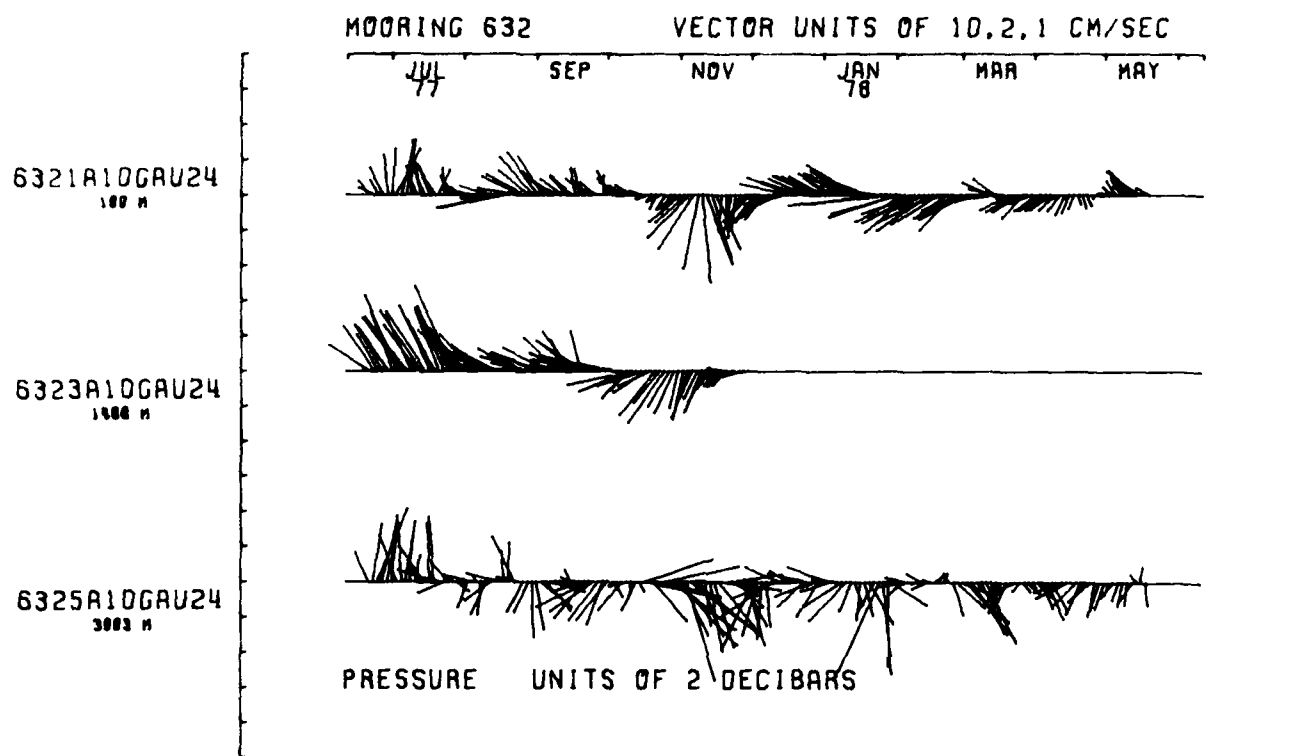
2904

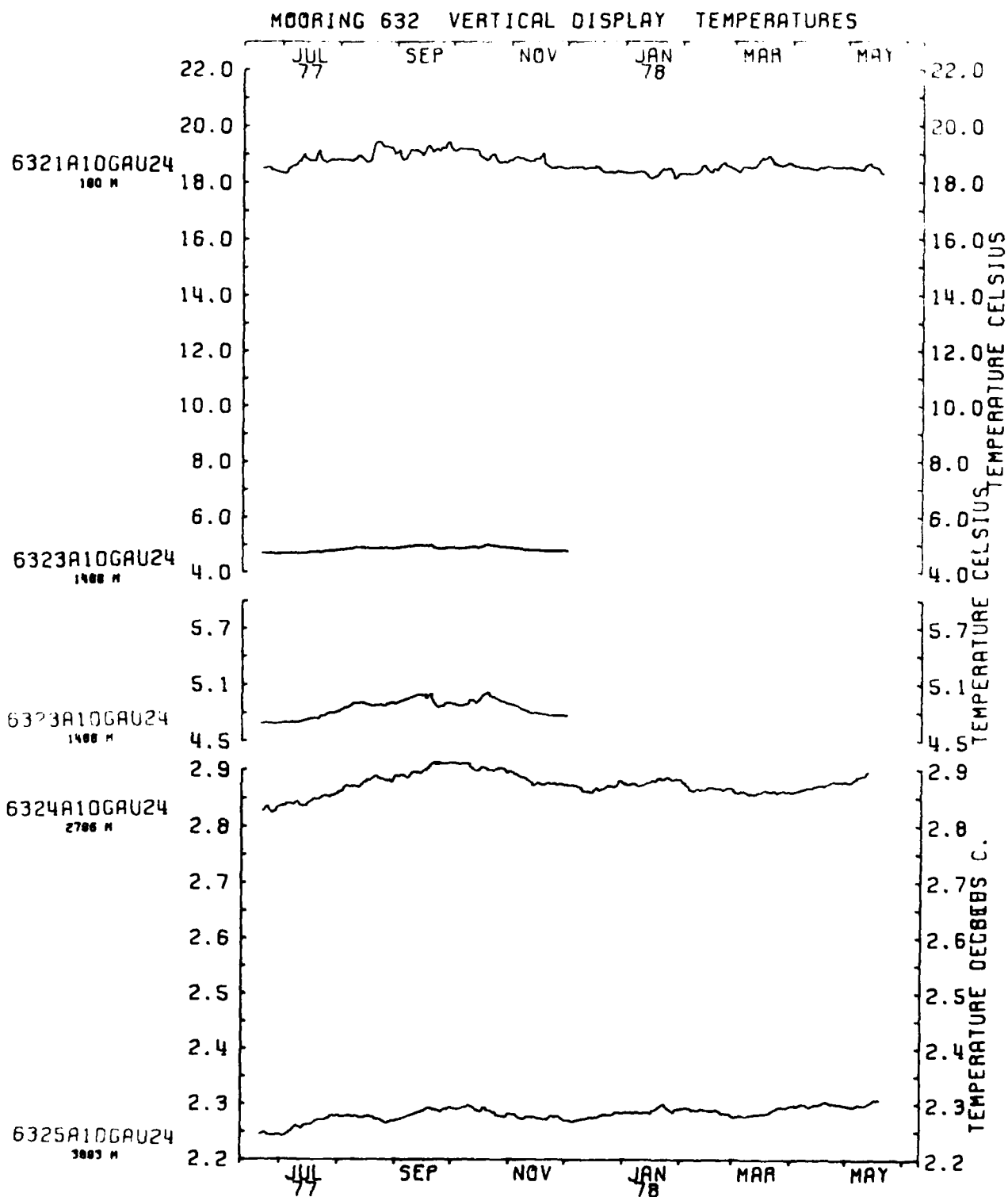
2904

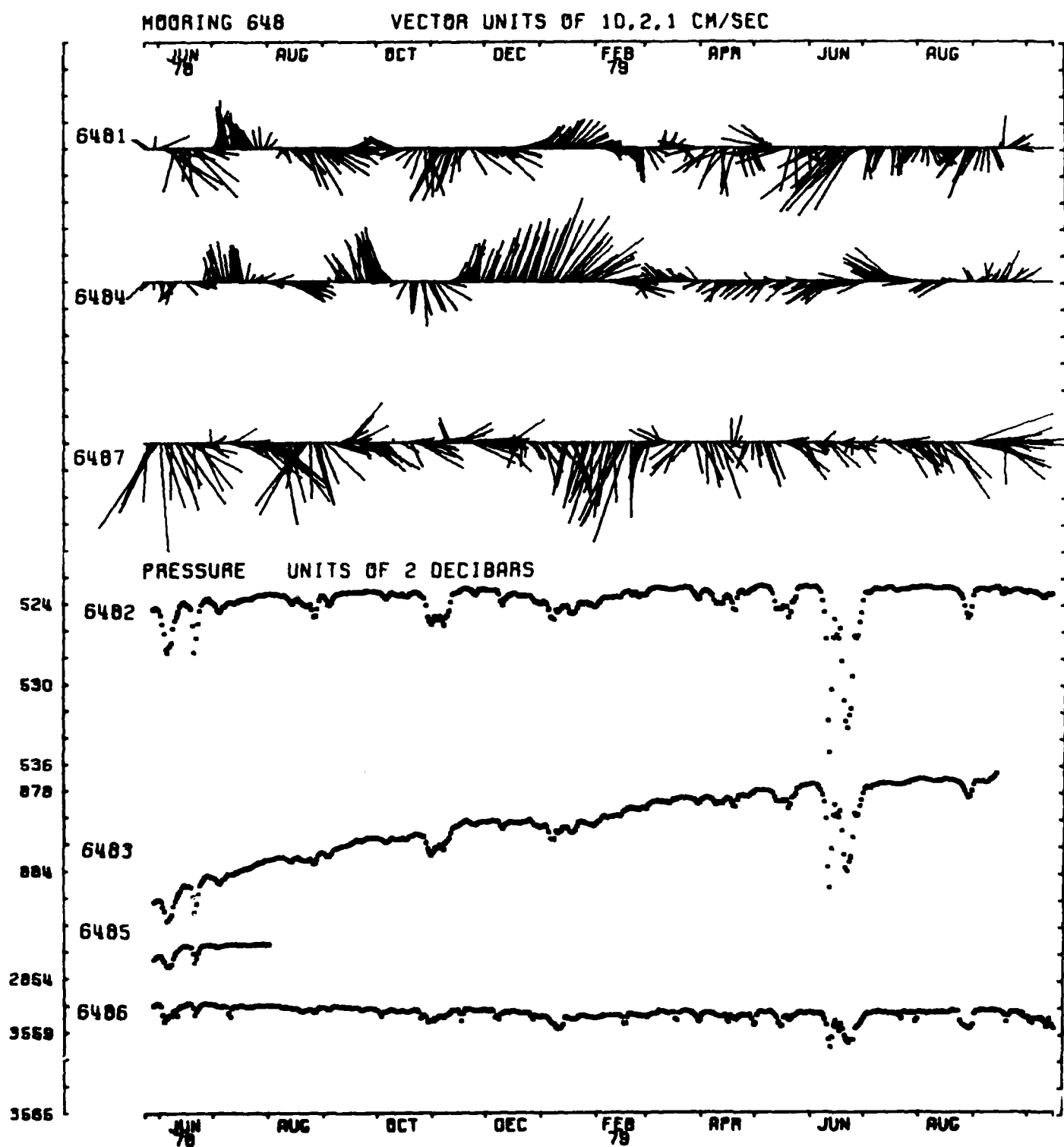
JUL 77 SEP NOV JAN 78 MAR MAY



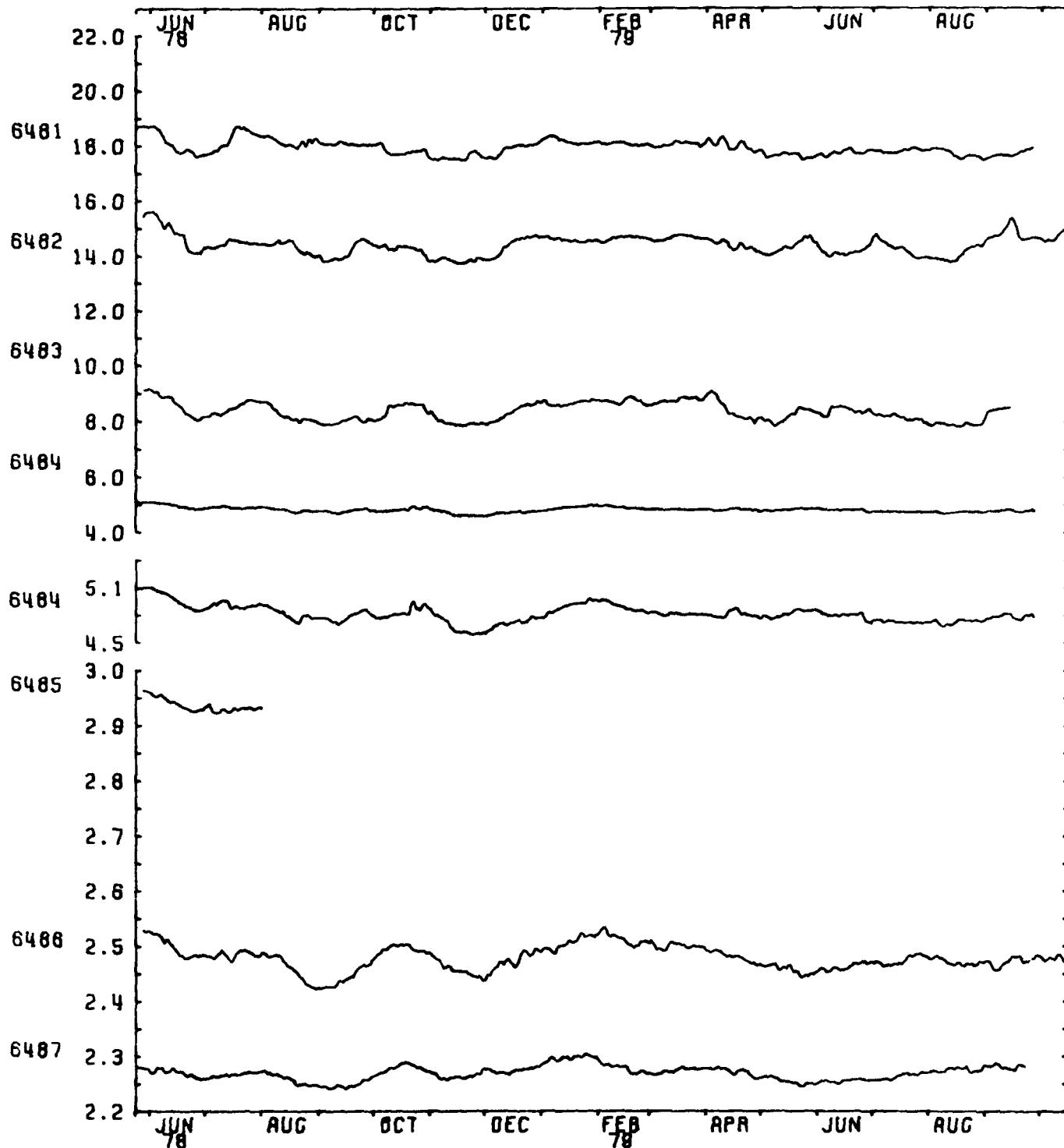






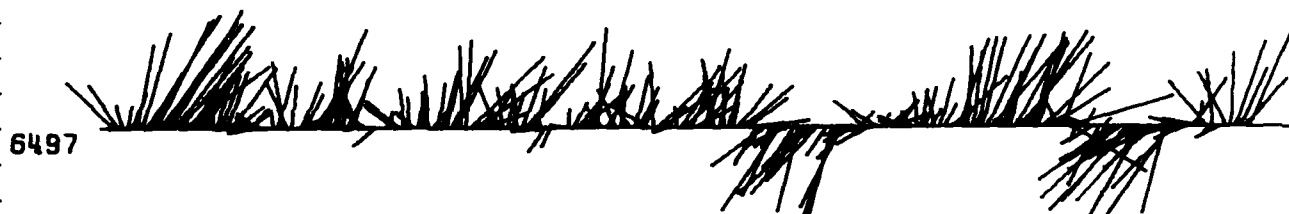
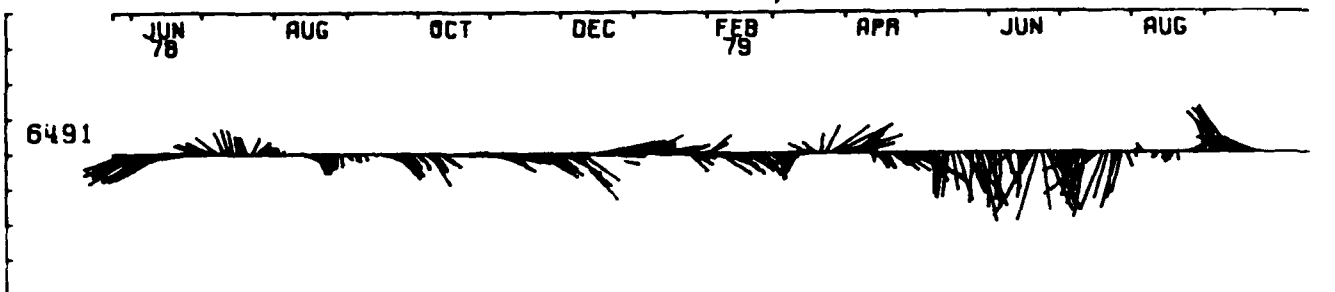


MOORING 648 VERTICAL DISPLAY TEMPERATURES

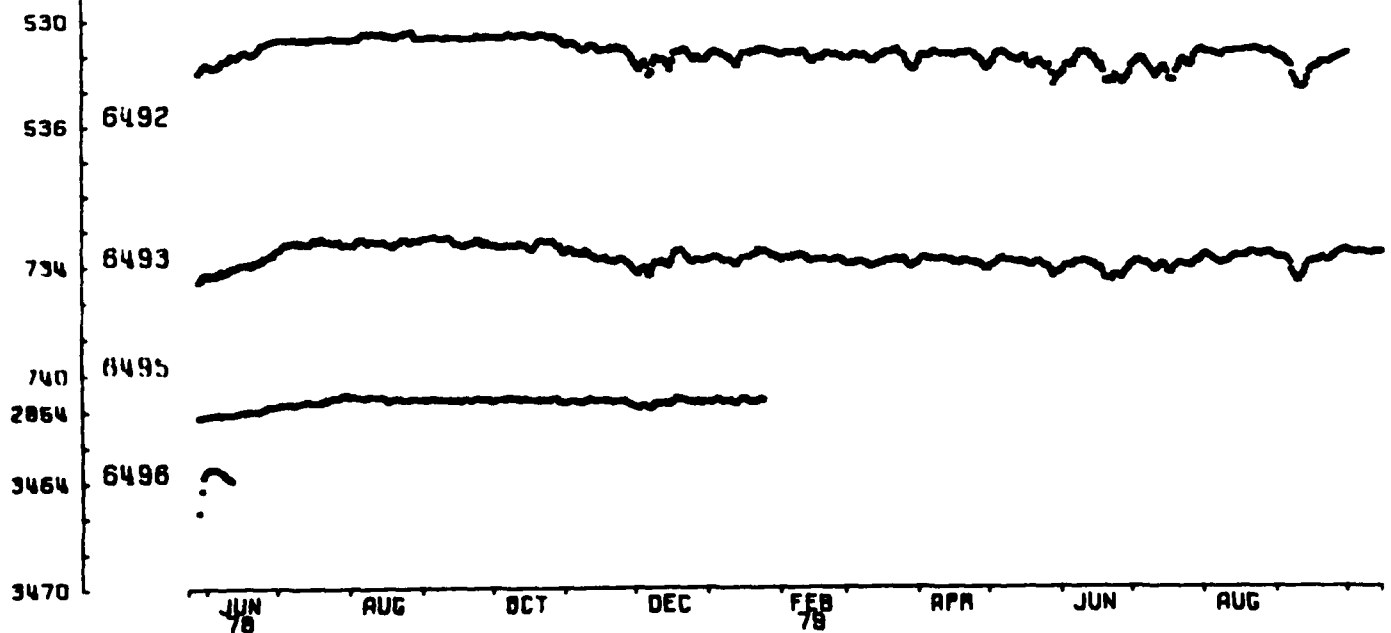


MOORING 649

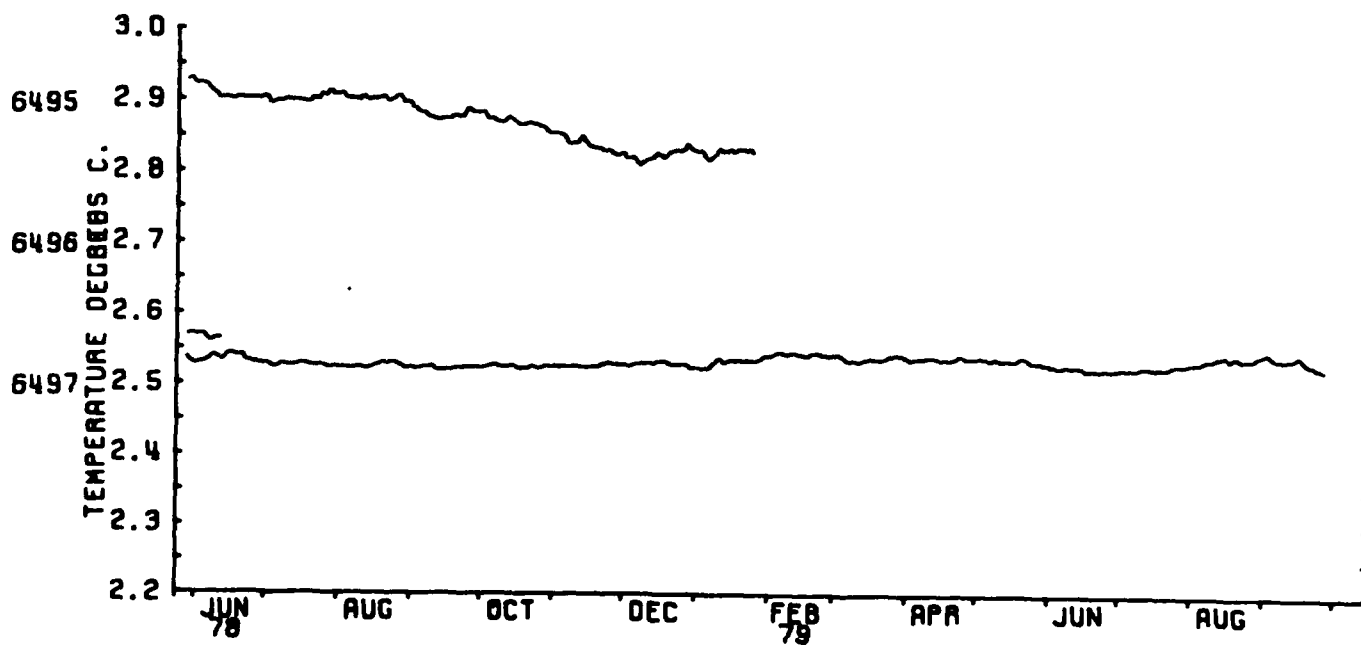
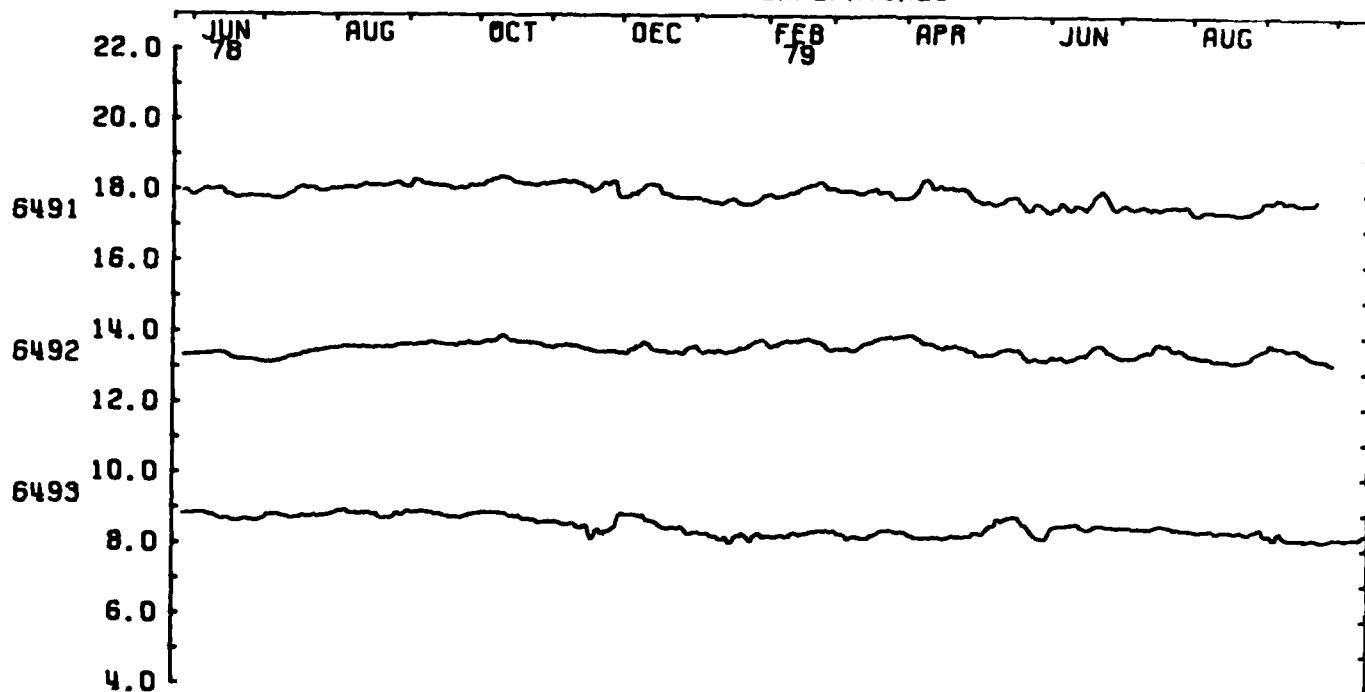
VECTOR UNITS OF 10 , 1 CM/SEC



PRESSURE UNITS OF 2 DECIBARS



MOORING 649 VERTICAL DISPLAY TEMPERATURES



MANDATORY DISTRIBUTION LIST

FOR UNCLASSIFIED TECHNICAL REPORTS, REPRINTS, AND FINAL REPORTS
PUBLISHED BY OCEANOGRAPHIC CONTRACTORS
OF THE OCEAN SCIENCE AND TECHNOLOGY DIVISION
OF THE OFFICE OF NAVAL RESEARCH

(REVISED NOVEMBER 1978)

- | | | | |
|---|---|----|--|
| 1 | Deputy Under Secretary of Defense
(Research and Advanced Technology)
Military Assistant for Environmental Science
Room 3D129
Washington, D.C. 20301 | 12 | Defense Documentation Center
Cameron Station
Alexandria, VA 22314
ATTN: DCA |
| | Office of Naval Research
800 North Quincy Street
Arlington, VA 22217 | | Commander
Naval Oceanographic Office
NSTL Station
Bay St. Louis, MS 39522 |
| 3 | ATTN: Code 483 | 1 | ATTN: Code 8100 |
| 1 | ATTN: Code 460 | 1 | ATTN: Code 6000 |
| 2 | ATTN: 102B | 1 | ATTN: Code 3300 |
| 1 | CDR J. C. Harlett, (USN)
ONR Representative
Woods Hole Oceanographic Inst.
Woods Hole, MA 02543 | 1 | NODC/NOAA
Code D781
Wisconsin Avenue, N.W.
Washington, D.C. 20235 |
| | Commanding Officer
Naval Research Laboratory
Washington, D.C. 20375 | | |
| 6 | ATTN: Library, Code 2627 | | |

UNCLASSIFIED 9/80

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER WHOI-80-40	2. GOVT ACCESSION NO. AD-A096467	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) A COMPILATION OF MOORED CURRENT METER DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME XXII (POLYMODE ARRAY III CLUSTERS A, B AND SITE MOORINGS) 1977-1979		5. TYPE OF REPORT & PERIOD COVERED Technical
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Susan A. Tarbell		8. CONTRACT OR GRANT NUMBER(s) N00014-76-C-0197; OCE 76-24232
9. PERFORMING ORGANIZATION NAME AND ADDRESS Woods Hole Oceanographic Institution Woods Hole, MA 02543		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR 083-400
11. CONTROLLING OFFICE NAME AND ADDRESS NORDA National Space Technology Laboratory Bay St. Louis, MS 39529		12. REPORT DATE September 1980
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 59
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) 1. Current meter 2. Ocean current 3. Moorings		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Summaries are presented of current, pressure and temperature measurements from clusters A and B of the POLYMODE III experiment. These clusters had five moorings apiece and were deployed for 11.5 months. With a few exceptions, current meters were set at nominal depths of 200, 1500 and 4000 m and temperature/pressure recorders at 400 and 2800 m on each mooring. A site mooring was deployed at both cluster locations for an additional 17 months. Displays include time series, histograms, progressive vector diagrams, scatter plots, spectra, and statistics.		

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-014-6601

UNCLASSIFIED 9/80

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Woods Hole Oceanographic Institution WHOI-80-40	<p>A COMPILATION OF MOORED CURRENT METER DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME XXII (POLYMODE ARRAY III CLUSTERS A, B AND SITE MOORINGS) 1977-1979 by Susan A. Tarbell. 59 pages. September 1980. Prepared for the Office of Naval Research under Contract N00014-76-C-0197; NR 083-400 and for the National Science Foundation under Grants OCE 76-24232.</p> <p>Summaries are presented of current, pressure and temperature measurements from clusters A and B of the POLYMODE III experiment. These clusters had five moorings apiece and were deployed for 11.5 months. With a few exceptions, current meters were set at nominal depths of 200, 1500 and 4000 m and temperature/pressure recorders at 400 and 2800 m on each mooring. A site mooring was deployed at both cluster locations for an additional 17 months.</p> <p>Displays include time series, histograms, progressive vector diagrams, scatter plots, spectra, and statistics.</p>	<p>1. Current meter</p> <p>2. Ocean current</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-76-C-0197; NR 083-400</p> <p>III. OCE 76-24232</p> <p>This card is UNCLASSIFIED</p>	<p>1. Current meter</p> <p>2. Ocean current</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-76-C-0197; NR 083-400</p> <p>III. OCE 76-24232</p> <p>This card is UNCLASSIFIED</p>
Woods Hole Oceanographic Institution WHOI-80-40	<p>A COMPILATION OF MOORED CURRENT METER DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME XXII (POLYMODE ARRAY III CLUSTERS A, B AND SITE MOORINGS) 1977-1979 by Susan A. Tarbell. 59 pages. September 1980. Prepared for the Office of Naval Research under Contract N00014-76-C-0197; NR 083-400 and for the National Science Foundation under Grants OCE 76-24232.</p> <p>Summaries are presented of current, pressure and temperature measurements from clusters A and B of the POLYMODE III experiment. These clusters had five moorings apiece and were deployed for 11.5 months. With a few exceptions, current meters were set at nominal depths of 200, 1500 and 4000 m and temperature/pressure recorders at 400 and 2800 m on each mooring. A site mooring was deployed at both cluster locations for an additional 17 months.</p> <p>Displays include time series, histograms, progressive vector diagrams, scatter plots, spectra, and statistics.</p>	<p>1. Current meter</p> <p>2. Ocean current</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-76-C-0197; NR 083-400</p> <p>III. OCE 76-24232</p> <p>This card is UNCLASSIFIED</p>	<p>1. Current meter</p> <p>2. Ocean current</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-76-C-0197; NR 083-400</p> <p>III. OCE 76-24232</p> <p>This card is UNCLASSIFIED</p>